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MINNESOTA:

ITS PLACE AMONG THE STATES.

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BEING

THE FIRST ANNUAL REPORT

OF THE

Minnesota

Commissioner of Statistics,

FOR THE

YEAR ENDING JANUARY 1st, 1860.

PUBLISHED BY AUTHORITY OF LAW.

HARTFORD:
PRESS OF CASE, LOCKWOOD AND COMPANY.
1860.

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HON. ALEXANDER RAMSEY, GOV. OF MINNESOTA.

SIR:

I have the honor to submit herewith, my First Annual Report upon the Statistics of Minnesota.

Your obedient servant,

J. A. WHEELOCK,

July 1st, 1860. *Commissioner of Statistics.*

Entered according to Act of Congress in the year 1860, by

JOSEPH A. WHEELOCK,

in the Clerk's Office of the District Court of the District of Minnesota.

H.4.P.L
5.00

ERRATA.

Tabular Series IV., referred to on pages 43, 44 and 45, omitted.
Table XI., referred to on page 89, omitted.
Table XIII., referred to on page 121, omitted.
Documents A. and B., referred to on page 122, omitted.

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PREFACE.

THERE were many reasons why the first annual publication of the Bureau of Statistics should have been delayed to embrace the results of the census of 1860; and not the least among these, was the fact that the month of February, 1860, was already advanced when the office was instituted, that several months must necessarily elapse before the correspondence of the office, embracing a new and diversified field of inquiry, could be efficiently organized and its results digested and published, and that in the meantime there was some risk that the materials, obtained with so much labor, might be left by the rapid current of events behind the time.

On the other hand, the census will of itself afford materials for a bulky volume, to the exclusion of topics which, though not within the purview of the census, lie at the foundation of statistics and especially concern the objects for which this office was instituted. The physical capabilities and geographical relations of states, afford, with the primary conditions of social development, the fundamental data of statistics. Agriculture, commerce, manufactures, and, after these, society, with its complex movements and relations, repose on these postulates of nature.

It happened, too, that the year 1859, which, in fact, completed the first decade of the political existence of Minnesota, was fruitful of events which furnished a felicitous commentary on the physical elements and topical conditions of its growth. The opening of a broad field of commercial activity to the citizens of Minnesota, in the north-west, the large advances of agriculture, the sudden and lavish overflow of production which, for the first time, brought our farmers into triumphant competition with the agriculture of the world in its central marts, the quiet but decisive return of prosperity upon conditions which seem to ensure its permanence are among the characteristics of the year which commences our annual series. Upon the foundation thus laid in the physics of the state, the census of 1860, whose results I hope to report to the Legislature before the close of its next session, will develop a superstructure of social detail in the natural and logical order of the series.

I should omit a public duty if I failed to express my appreciation of the promptness and cheerfulness with which my inquiries were responded to by a large majority of the public officers of whom information was sought. This is the more due to them, as the nominal compensation which the law allows them is in most cases entirely disproportionate to the services performed. The labor of examining the records for the transactions of a series of years will not, however, have to be repeated hereafter. It is not surprising that, upon instituting an unusual and somewhat laborious inquisition into the public records, requiring the cooperation of nearly the whole body of public servants, there should be some who would fail to comprehend its objects, or be unwilling to advance them. Although the delinquent respondents to my circulars are not numerous, they are sufficiently so to give a character of incompleteness to the data under the several heads, which has been only partially remedied in the general results by laborious computations of averages.

I have been largely indebted to the courtesy of gentlemen connected with various branches of the Federal service, and to numerous private correspondents, for valuable favors, often involving a great deal of labor. The insufficiency of the sum appro-

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priated for the purpose, has been the occasion of over two months' delay in the publication of this volume, and, in fact, made it impossible to procure its publication in the form desired. Its cost, in its present shape, has so far exceeded the means at my disposal, that I have been compelled to exclude a large amount of matter prepared for this volume. Among the articles excluded, I regret exceedingly to be obliged to postpone to my next report, a valuable paper by Dr. C. L. Anderson, on the "Botany of Minnesota," with a very extensive catalogue of our native plants. Also a series of elaborate "Tables of Distances" prepared with great care, by Mr. A. J. Hill, of St. Paul; a list of Post Offices in Minnesota, with the statistics of each, obtained through Hon. H. M. Rice, at the department; a table of Mail Routes and distances thereon, by A. J. Hill; a Calendar of Minnesota, by A. W. Adams, of Shakopee; a full Official Directory of the state; a Statistical Directory of the churches, and a valuable series of tables prepared in illustration of the text, including the table of agricultural products in the different counties, which alone involved the labor of three months in its preparation. These tables, however, are omitted with less regret, as their general results are given in the text. The Calendar and Directories will form a permanent feature of future volumes.

Minnesota enjoys an enviable reputation for the healthfulness of its climate, and for its entire exemption from diseases which are the peculiar scourge of other western states. It is to be regretted that no means exist for registering the results of common experience in this regard. The positive testimony of statistics is only wanting to give its legitimate influence to this attractive feature of the climate. The Legislature will promote an important public interest by providing for the registration of births, marriages and deaths, on the simple and economical plan of Vermont.

In this book there is, for obvious reasons, no attempt at strictly scientific classification. Its humbler but perhaps more practical purpose will have been served if it shall help to make Minnesota better known abroad and at home. J. A. W.

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STATISTICS OF MINNESOTA.

CHAPTER I.

THE COMMANDING GEOGRAPHICAL POSITION OF MINNESOTA.

1. Its Position in the Physical System of the Continent.

Minnesota, lying between the parallels of 43½° and 49° of north latitude, and 89° 29′ and 97° 5′ of west longitude, occupies the actual center of the North American continent.

In ancient maps, compiled by the geographers of the middle ages, Jerusalem was placed in the center of the world, as the point to which every other object was to be referred, and the earth was made a circle surrounded by the ocean, the shores of which were represented as nearly equidistant from that spiritual capital.

Without imitating the pious extravagance of Sanudo, the position of Minnesota in the physical system of this continent may be described as the western counterpart, upon the inland waters of America, of the Asiatic summit of the Mediterranean basin; the *omphalos* of the new, as Jerusalem of the old world.

Excluding exceptional irregularities of outline, the mass of North America may be described as contained in an ellipse resting on the concentric arcs of the frigid and torrid zones, whose transverse axis, extending through fifty degrees of latitude north and south, and conjugate diameter crossing fifty degrees of longitude east and west, intersect at the heart of Minnesota. The point thus fixed as central to the external configuration and climatic extremes of the continent, is lifted to the summit of geographical significance by its central and commanding relations to the whole interior physical system of the continent.

For the geographical center of North America, at the heart of Minnesota, is also the pinnacle of its great water shed, the central source of those majestic rivers whose broad basins determine the physical contour, the climates, the commercial movements, the avocations, and the political destinies of two-fifths of the continent.

All the grand features of the continent, moulded and adjusted by the supreme sway and pressure of the primeval waters whose Ararat was here, are harmoniously grouped by the sublime gravitation of nature around this central summit.

Minnesota lies midway between the Arctic and Tropic circles; midway between the East and West coasts of the continent; midway between Hudson's bay and the gulf of Mexico; midway between the Appalachian and Rocky Mountain Chains, and midway between the northern and southern limits of the arable districts of the continent.

The elements of the geographical position of Minnesota may be described as embracing its relations to the physical structure of the continent, to its hydrographical system, to its climates, and to the movements of continental development.

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2. The Great Interior Plain of North America.

In the generalizations of Physical Geography, the adjacent valleys of the St. Lawrence, the Mississippi, and the Winnipeg may be regarded as forming one vast integral and homogenous plain, throughout which every diversity of soil and vegetation covers a uniform geology of the secondary or sedimentary rocks, with an interior dip from the primary upheavals of the Atlantic and Pacific slopes towards the beds of these mighty streams.

The outlines of this great basin correspond precisely with the simple external configuration of the continent—a huge triangle, expanding northward from the delta of the Mississippi with the fan-like reaches of its tributaries, its eastern and western sides following respectively the summits of the Appalachian and Rocky Mountain chains, and its northern base coinciding with the Arctic water shed, its angles embracing the summit of north-western navigation on the Saskatchewan and the southern and eastern outlets of the continental system of waters at Quebec and New Orleans.

This great trilateral plain has an area of 2,200,000 square miles; or to carry its north-western angle to the limits of wheat culture at the forks of the McKenzie, and include the submontane gulf-region of the Mississippi, the area of the interior North American plain may be stated at 2,500,000 square miles, one-third of the whole area of the continent; equal to two-thirds of that of Europe, and four-fifths of the American Union. Three-fifths of the whole mass lie within the national domain of the United States, of which it absorbs more than one-half, taking in seventeen states or parts of states, and five territories or parts of territories. Two-fifths lie in British America, including both the Canadas and all the agricultural region west of Lake Winnipeg.

It contains an American population of fifteen millions, more than half the population of the Union; and a British colonial population of over two millions, comprising within the Canadas and Rupert's Land nearly all the civilized inhabitants of British America.

3. Its Remarkable Adaptation to Agricultural and Commercial Pursuits.

One-half the whole of that portion of the continent within the climatic limits of successful agriculture is occupied by this great alluvial basin. A vast plain, formed at the same geological epoch, by the same causes, operating equally upon homogenous materials, covered throughout its whole extent with a uniform calcareous mould of inexhaustible fertility, zoned in the harmonious transitions of nature with the characteristic flora of all climates, and producing in spontaneous abundance the staples of each; underlaid by inexhaustible beds of coal and precious minerals, and clothed with alternating belts of forest timber and pastoral plain; watered throughout its whole extent by noble rivers and seas, and flanked on either hand by the commercial seaboards of the east and west coasts, and the hungry millions of the old world—all the circumstances of its position and structure indicate it as the imperial domain of agriculture in its highest development, of an agriculture reposing on the most perfect conditions; no longer isolated and rustic, but elevated to the rank of a glorious art by the appliances of science and mechanism; the genius of a civilization in which commerce shall be slave instead of mistress, to carry the affluence and culture of cities through the ramifications of its natural and artificial highways, to all the homes of a people at once rural in their virtues and metropolitan in their refinements.

To this agricultural region the Atlantic seaboard bears the relation of a counter, across which the interior producer transacts his exchanges with the markets of Europe; and the northern chain of lakes and rivers, penetrating to the heart of the grain and wool region and reaching through the windings of the Saskatchewan to the limits of wheat culture on the continent, affords to the farthest settler of the north-western frontier a cheaper access to the markets of Europe than is had by the Russian peasant upon the fertile banks of the Volga.

The parallels of 60° and 30° north latitude mark the northern and southern limits of this central plain. The interval between these extremes exhibits in soft and almost insensible transitions, from one thermal elevation to another,

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the whole range of vegetable diversities from tropic to arctic flora. The cotton, sugar, rice, and fruits of the south, merge by gentle graduations into the cereals, the hardy roots, the nutritious grasses, the flocks and herds of the north. Every parallel in the ascending scale is deficient in what its neighbor abounds, or is affluent in what its neighbor needs.

Nature, which has thus laid the foundations of an active commercial interchange in the physical diversities of this interior western world, has also supplied the means of commercial intercommunication on a scale commensurate with the grandeur and beneficence of her schemes. The Mississippi, the Red and Saskatchewan rivers form a chain of navigation, 5,000 miles in length, from New Orleans to Fort Edmonton, interrupted only by a narrow portage across the levels of Western Minnesota.

4. Influence of the Great Basin on the Forms of American Civilization.

The position and configuration of the central plain of North America, intermediate between two worlds, exerts a supreme influence in the development of American civilization.

In Europe and Asia, rugged and icy mountain chains, crossing the continents in all directions, isolate the valleys and place eternal barriers between the nations which inhabit their slopes. Hence the heterogenous peoples, languages and political systems of those continents. Africa and South America are similarly split into incoherent geographical fragments, to which their nationalities and political systems conform. North America is the antithesis of the old world in geography, and accordingly of society.* To use the illustration of Gilpin, "the interior of North America presents toward heaven an expanded bowl to receive and fuse into harmony whatsoever enters into its rim. So each of the other continents presenting a bowl reversed, scatter everything from a central apex into radiant distraction."

Conformably to these emphatic geographical facts, which have governed all empires in all ages, diversity and incoherence, which mean War, characterize the societies and institutions of the old world; unity, which means Peace, is the law of American civilization. Accordingly, the history of this continent is a continued illustration of the dominating influence of the simple and grand forms of its physical structure upon the development of American nationality.

Within the last half century the Mississippi Basin has gathered within its vast solitudes a population five times as great as the whole of the united colonies at the epoch of the revolution, collected from every nation and race under the sun—their differences obliterated in a single generation—and fused into one harmonious people. We have thus presented to us within this central theatre of colonization, for all the world, the sublime spectacle of the pre-destined affiliation of mankind—its diverse tribes moulded over into one eclectic and representative nationality, enriched with the blended blood, and endowed with the historical attributes of all nations—"a people one and indivisible—identical in manners, customs, language, religion and laws."

5. Physical Preponderance of the Great Interior Plain.

The preponderance of the great interior basin in the physical system of the continent, will be illustrated by the following table:—

The area of the North American Basin, as compared with the Exterior Slopes of the Continent.

Territory.	Area in Square Miles.	Great Plain.	Area in Square Miles.
Pacific Slope, . .	1,500,000	Mississippi Basin, .	1,217,562
Atlantic Slope proper, .	620,000	Western Gulf Region, .	250,000
Hudson Bay and Arctic		St. Lawrence Basin, .	475,000
Declivity, .	2,575,700	Winnipeg Basin, . .	400,000
	4,695,700	Peace River Valley, .	100,000
			2,442,562

*Col. Gilpin.

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The area thus drained by the three rivers which centre in Minnesota, is equal to the combined basins of the Nile, the Euphrates, the Indus, the Ganges, and all other rivers of India, and of all the rivers of Western Europe, and more than twice the area drained by all the European rivers which empty into the Mediterranean.

Subtracting the Arctic and Hudson Bay slopes from the habitable areas of the continent, the Great Interior Basin is shown to embrace more than half the region which lies within the climatic limits of Agriculture.

Area of Great Plain in square miles,	2,442,562
Area of the habitable remainder,	2,120,000

6. Facilities of Internal Commerce.

The extent of navigable waters which permeate this vast region, is its most remarkable feature, and exhibits a facility of inter-communication possessed by no equal area in the world.

The Shore Line of the Great American Basin, including both banks.

Shore Line of Mississippi and tributaries, (Col. Abert's authority,)	35,644
Of Northern Lakes and St. Lawrence, do.	7,749
Of Red river, Lake Winnipeg and Saskatchewan, (estimated,)	6,188
Total Shore Line of Great Basin,	49,581

The total navigable shore line of the Great Basin exceeds the coast line of the Atlantic and Pacific, and is nearly three times the navigable shore line of all Europe.

A comparison of the ratios of areas of different regions of the globe to their respective amounts of shore line, will exhibit the vast advantage possessed by the Great American Basin, over every other.

Region.	Ratios of surface to one mile of coast.	Region.	Ratios of surface to one mile of coast.
Europe,	156	Africa,	623
North America,	228	Asia,	459
United States,	241	Great American Basin,	49
South America,	376		

The result shows for the Great Basin three times as much navigation in proportion to surface, as Europe, four times as much as the continent in general, and five times as much as the whole United States.

7. Social and Political Preponderance of the Great Plain.

The following table, showing the comparative progress of population in different geographical divisions of the continent under Anglo-American rule, will exhibit the rapid advance of the great plain, to the social and political supremacy of the continent.

Comparative increase of population on the maritime and Interior Slopes.

	1790.	1810.	1830.	1850.
Maritime Slopes,	3,703,116	5,874,708	7,844,632	11,174,464
Interior Plain,	221,711	1,665,106	5,656,288	13,716,406

The comparative ratios of increase per cent. for periods of 20 years, being as follows:—

	1790 to 1810.	1830.	1850.
Maritime Slopes,	42	33	58
Interior Plain,	648	239	142

Starting in 1790 with *one seventeenth* of the population of the continent, the Spanish American states being excluded, the population of the great plain in 1850 exceeded that of the coast by 2,500,000, and was advancing with an impetus which promises, in fifty years more, to give it double the population of the Atlantic and Pacific states combined.

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The census of 1850, of the United States, actually transferred the weight of political power, and with it the control of the government, if they had chosen to unite their interests, to the states of the western plain.

The census of 1860, adding millions to the towering ascendancy of the Mississippi valley, solemnly commits the destinies of the republic to the inviolable pledge of its geographical unity. The strifes of sections which did not originate and can not prevail under this majestic symbol of national concord, will not sever the strong cords of its federation, till they can break the multiplex strands of its mighty commercial system. The Union rests securely upon this immovable base. The political supremacy of the Mississippi valley is, in the social affairs of this country, what the force of gravitation is in nature—a resistless power, underlying and controlling the oscillations of parties, and constraining the tempests that break upon the shore to a supreme law of order.

8. Minnesota the Hydrographical Centre of the Great Plain.

This vast interior basin, rimmed by the mountain chains of the ocean coasts, with an area of 2,500,000 square miles, with a population of 15,000,000, increasing at the rate of fifty per cent. every ten years—embracing the productions of all climates, and the wealth of every soil—culminates in Minnesota, as the apex from which its grand divergent valleys slope to their ocean outlets; the common source and center from which, as from the hub of a vast wheel, the great ship-bearing rivers radiate to its ocean rim.

The origin, the courses and the character of these inland waters are prominent attributes of the geographical position of Minnesota.

The Mississippi River.—The Mississippi river, originating in the lacustrine steppes of Northern Minnesota, in latitude 47° 13′ 35″, and longitude 95° 2′, gives 900 miles of its waters to its mother state, 400 miles of which is navigable with only two interruptions before it reaches the head of continuous navigation below the falls of St. Anthony, whence, starting at a more majestic pace, and gathering on its bosom the commerce of fifteen states, it empties in the Gulf of Mexico, at a distance through its winding channel of 2,187 miles, from Saint Paul, and 2,896* miles from its source in Lake Itasca, embracing in its affluents an area of 1,217,562 miles, a population of 13,000,000, and an aggregate navigable shore line of 35,644 miles.

The St. Lawrence.—The St. Lawrence—the summits of whose sources interlap with those of the Mississippi—fed from the copious gushings of the same maternal fountain, and whose Mediterranean expansion washes our northeastern boundary, at the utmost western limit of its navigation, flows eastward from the mouth of the St. Louis river, with the volume of an inland sea, and a channel wide and deep enough to float the navies of the world, for 2,400 miles along the British American frontier, washing 2,620 miles of American, and 3,500 miles of British shore, before it empties into the Gulf of St. Lawrence.

The actual basin of the St. Lawrence has an estimated area of 475,000 square miles, and contains a population of 3,500,000, but its commercial influence dominates over a large portion of the eastern slope of the Mississippi. Of the ten states and two provinces, with an aggregate population of 15,000,000, which have a frontage upon the lakes, only two, Upper Canada and Michigan, are entirely within their basins.

The Red River.—The utmost sources of the Red river of the north were found by Nicollet, upon the summits of the same narrow ridge whose copious springs gave birth to the Mississippi, and upon the same level.

Turning its southwesterly current towards the north, at the point where its waters become navigable, it washes the western boundary of Minnesota for 380 miles, and traversing 154 miles of British territory, interlocks in Lake Winnipeg with the waters of Saskatchewan, whose mighty volume rolls for 1,400 miles from the base of the Rocky mountains, and discharges itself through Nelson's River into Hudson's Bay.

*Nicollet.—See these distances corrected in tables, by A. J. Hill.

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9. Minnesota, the Commercial Centre of the Continent.

Such are the Titanic progeny of Minnesota. Such the gigantic arms with which she grasps the extremities of the continent. These three great channels of internal commerce, converging from the antipodal extremes of the great plain, and bringing together all its infinite gradations of climate and production in one integral and simple geographical and social mass, unite upon Minnesota, as their common link of intercommunication, and thus concentrate upon this spot all the latent and active commercial forces of the continent.

According to the present distribution of the commercial interests of the continent, its manufacturing and maritime power is located in the North-eastern states, the seat of the staples of tropical agriculture at the south, of bread, provisions and wool, in the North-west. The bread and provisions of the North-west go to feed the manufacturer and merchant of the North-east and South; the North-east supplies the South and North-west with the fabrics of domestic or foreign manufacture; and the South supplies the North-east with the raw material of manufactures, and the whole North with sugars, tobacco, rice, fruits, &c. This is the natural and permanent adjustment of the industrial and commercial interests of the Union. The movements of national commerce, following the Atlantic, the lakes and the Mississippi, describe the three sides of a triangle. These lines of commercial movement accord with the tri-lateral outlines of the great basin, the same hydrographical features that determine the physical structure of the continent, fixing also the channels of its intercourse. As these lines are extended by the progress of colonization, to include the undeveloped basin of the Winnipeg in the agricultural empire of the North-west, Minnesota must necessarily become the focus of distribution for a commerce between the Winnipeg and Mississippi valleys, exceeding all the commercial exchanges of the present states of the Upper and Lower Mississippi, and for a commerce between the Red river and Lake Superior, exceeding all the present through trade of the northern lakes. The entire exports of Central British America, whatever they may be in the future growth of that country, must find their inevitable outlet, as its furs and skins do now, across Minnesota, through the lakes or the Mississippi; and the imports into that country must be received, as they are mainly now, by the same channels. Here are four distinct commercial movements arising out of the relations of Minnesota, to the Red river valley, having Minnesota as their common point of *internexus*, each involving two transhipments within her borders, upon her eastern and western water lines, and laying, therefore, a double tariff on all through freightage over her territory, to swell the commercial revenues of her people. Three hundred and fifty miles of railroad to connect the head of navigation on the Mississippi and Lake Superior, with the navigation of Red river, is all that is necessary to integrate this splendid commercial system, and to centralize the profits of its exchanges in Minnesota.

10. Western British America the Basis of the Commercial Position of Minnesota.

From what has been said it will be seen that Minnesota derives whatever of commercial consequence it may possess, as an entrepot of inland exchanges, *exclusively from its commanding the sole outlets of the tributary* plain of the Winnipeg. These northwest valleys have the same relation to Minnesota, the same relative subordination to its commercial interests, as the north-western United States to New York and Massachusetts; and it is the proud distinction of Minnesota, not only that this magnificent commercial dependency belongs to her alone of all the states of the Mississippi valley, but that, of all the states of the west bank of the Mississippi, *she alone posseses any tributary back country whatever*. All the lower states of the west side occupy a narrow margin of fertile lands, beyond which, west of the 98th parallel, a sterile and arid desert stretches to the "dewy lips" of the Pacific. The commercial development of those states is, therefore, restricted to their individual resources. From the summit of the Winnipeg basin the horizon of Minnesota expands to the shores of the Pacific.

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11. Geographical Description of the Winnipeg Basin.

Dimensions.—The region of British America drained by the rivers flowing into Lake Winnipeg has the general form of a parallelogram, lying between the parallels of 49 and 55 degrees north, and extending from Lake Winnipeg and Red river, westward, to the Rocky mountains, with a breadth of 400 and a length of 800 miles.

The Red river valley, projecting southward of the international boundary to the prairie terraces of Minnesota, whence it derives its waters, adds to this tract 35,000 square miles of American territory.

The whole area of the Basin of the Winnipeg is grossly estimated at 360,000 square miles—equal to eight first class states of the size of New York or Pennsylvania, and nearly six times as large as all New England.

The Saskatchewan river.—The Saskatchewan river, whose two great branches drain two-thirds of this district, is the most important of the confluent rivers of the Winnipeg basin. Both its great branches rise in the Rocky mountains, close to the sources of the Columbia and Fraser rivers, and, gathering in each at the base of the mountain slope a volume of water sufficient for navigation, flows eastward to Lake Winnipeg, crossing eighteen degrees of longitude, through undulating slopes of green and grassy uplands, the favorite pasture of myriads of wild cattle. This great stream affords, in both branches, about 1,400 miles of steamboat navigation, of which 400 miles are the joint volumes of the confluent streams.

The Red river.—The Red river rises in the affluents of Elbow lake, in Minnesota, close to the sources of the Mississippi, and flows south-westwardly though a chain of beautiful lakes, till it receives the waters of the Sioux Wood, from the south, whence it runs with a narrow and winding, but sluggish and navigable current, through a rich alluvial plain, due north, at right angles to the Saskatchewan, for 520 miles, of which 380 miles washes the western boundary of Minnesota. This river, though of far less volume and length than the Saskatchewan, is, in some respects, a more important stream, as its valley forms the connecting link between the basins of the Mississippi and the Winnipeg, and their respective systems of navigation.

The Assineboine.—The Assineboine, draining the plain between these rivers, is the principal tributary of the Red river, into which it empties, about seventy miles above the international boundary. This river supplies some two hundred miles of doubtful navigation.

The Red Lake and Sioux Wood rivers in Minnesota, the Shayenne and Pembina in Dakota, are the principal tributaries of the Red river in American territory.

Lake Winnipeg.—Lake Winnipeg, 264 miles long, and averaging 35 miles wide, and the common reservoir of these confluent streams, discharges its waters, through the precipitous channel of Nelson's river, into Hudson's bay. Connected with Lake Winnipeg on the west, by navigable channels, are two other large bodies of water—Lakes Manitoba and Winnepegoos; being together nearly as long as Lake Winnipeg, with about half its breadth. The water area of these three lakes will equal that of Ontario and Erie combined.

12. Physical Structure.

The converging valleys of the Winnipeg system, though subordinate to the great Hudson's bay slope, form a distinct hydrographical basin, abruptly insulated from the circumjacent expanse by its geological structure, its depression below the general level, its climate and its flora.

Limestone forms the bed of the basin, and occupies its whole extent, except its western flank, in the slopes of the Rocky mountains, where, it is stated, that an immense development of coal occupies the whole breadth of the Saskatchewan drainage, with a longitudinal width of 150 miles.

The eastern limit of this district is abruptly defined by Lake Winnipeg, which washes the limestone on its western shore, and the granitic uplift of the Arctic watershed on the east. Its southern boundary is indicated by a like bold transition to the cretaceous steppes of the Missouri, nearly coincidant with the

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international line of 49°; on the west the belt of coal, already alluded to, occupies a narrow interval between the limestone and the primitive upheaval of the Rocky mountains; on the north a chain of lakes and streams, winding about the parallel of 55°, marks a similar disappearance of the silurian in the primary formations.

The natural boundaries of the Winnipeg basin thus coincide with a girdle of granitic or cretaceous elevations, which mark bold transitions on every side, from the rich calcareous soil, which is the characteristic association of the limestone, to the regions of barren sands or clay which support the thin vegetation of the Arctic highlands or the Missouri steppes.

13. Remarkable Depression of Surface.

Throughout nearly its whole extent the undulating prairies of the Winnipeg slope support a rich growth of grasses and herbage, on which countless herds of buffalo find their favorite ranges in winter and summer.

This fertile plain is in every respect the continuation and complement, in the upper belt of the temperate zone, of the silurian substratum and surface forms of the Mississippi valley, which spans its lower belt, and with it and the valley of the Mackenzie river, constitutes that characteristic interior depression of the continent between the Atlantic and Pacific systems of mountain plateaux, to which the name has been given of "The North American Basin." The valleys of the Minnesota and Red rivers, in this state, are the connecting links between those continuous basins. These valleys are only separated on the western border of Minnesota by a narrow neck of land, two or three miles wide, which divides Lac Traverse from Big Stone lake. So low is this barrier that in the spring freshets it is submerged in the overflow of the adjacent lakes. The water line of these lakes is only elevated 966 feet above the level of the sea, and the surrounding plain is but a few feet higher. The Red river valley slopes gently from this elevation to Lake Winnipeg, 853 feet above the sea, where it meets the inclined plain of the Saskatchewan, which has an average altitude of 1,200 feet above the sea.

The general level of the adjacent districts is much higher. The granitic ridges of the Hudson's bay declivity, the "Heights of land" in Minnesota, the Coteau des Prairies, the Missouri plateaux, constitute a girdle of elevations around this basin, increasing in height from east to west till they culminate in the Rocky mountains, at an altitude of 15,000 feet above the sea. A similar system of hilly ranges, progressing in elevation towards the central dome of the continent, in Utah and New Mexico, and the parallel mountain chains on the east, enclose the valley of the Mississippi.

This broad depression, ranging through thirty degrees of latitude, exercises a remarkable influence upon the distribution of the interior temperatures of the continent, partly as the effect of inferior elevation, and partly in consequence of the softening and fertilizing currents of air which are received into it, at its southern extremity from the Gulf of Mexico, and at its northern, through the gorges of the Rocky mountains from the Pacific. The effect of both these causes is to occasion a remarkable northward deflection of the lines of mean temperature, carried to the Pacific, around the head of the Northern Lake Basin, lifting the climate of Minnesota, Wisconsin and New England up to the fifty-fifth and even to the sixtieth parallel of north latitude, that is to say, to a line a thousand miles north of Saint Paul.

14. Climatological Description. Thermometrical Statistics.

Within these sub-arctic plains, between latitude 47° and 60° north, is reproduced the climate of Western Europe in the corresponding belt of the temperate zone. "Nine-tenths of European Russia, the main seat of population and resources," says Mr. Taylor, "lies north of Saint Paul. Pembina is the climatic equivalent of Moscow, and for that of St. Petersburg, which is 60° north, we may reasonably go to latitude 55°."

The luxuriant summer climate and exuberant verdure of this secluded basin, sharply defined on the east and north against the arctic ridges of the barren

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highlands that slope towards the Frozen sea, repeat on a magnificent scale along its borders the abrupt climatic contrasts of the Switz valleys, whose green summers are girdled by the icy summits of the Alps.

This insular valley climate, oscillating between the equatorial winds of its summers and the winter blasts that sweep from the ice-fields of the arctic coast, is characterized by extremes of temperature probably greater than any other part of the continent; while the annual mean is higher than that of the same parallels of Western Europe, including some of the best agricultural regions of that continent. The difference between its hottest and coldest months as compared with other climates of great annual range, will be shown in the following table, as also the difference between the mean winter and summer temperatures.

Place.	Annual Mean.	Difference between hottest and coldest months.	Difference between summer and winter.	Latitude.	Longitude.
	° ′	° ′	° ′	° ′	° ′
Red River Settlement,	34 38	82 15	74 61	50 15	
Fort Snelling, Min.,	44 6	59 7	54 5	44 53	93 10
Green Bay, Wis.,	44 8	52 6	48 1	43 31	89 28
Detroit, Mich.,	47 2	42 8	40 8	42 20	82 58
Montreal, Canada,	42 3	55 7	51	45 31	73 34
Ozenburg, Russia,	35 6	66 38	59 66	50 46	55 6 E.

It is the excessive cold of the long winter season, embracing five months of the year in this latitude, which reduces the annual mean.

The mean for the three winter months of December, January and February, at the Red river settlement is 6° 85′. At Fort Snelling it is 16°; at Green Bay, 19° 9′; at Detroit, 26° 8′; at Montreal, 16° 3.′

But it must be remembered that the Red river settlement lies upon the very edge of this climatic belt, in close proximity to the arctic declivity of Hudson Bay, and is by far the coldest part of the whole basin of the Winnipeg. The climate grows rapidly warmer on the same parallels westward, even when there is an increase of elevation.

It is warmer at Fort Benton on the Missouri than at Saint Paul; Fort Benton being 7½ degrees of longitude west of Saint Paul, while it is 2½ degrees of latitude further north, and 1,843 feet higher in relative elevation.

"The mean winter temperature at Fort Benton," says Blodgett, "is 25 degrees, the same as that of Chicago, Toronto, Albany, and Portland, Me. At Saint Paul it is but 15 degrees, being 10 degrees less. It is not so cold as this on the south branch of the Saskatchewan."

14. The Red River Winter.

Mr. Blodgett claims that the whole Saskatchewan valley has a climate very nearly as mild in its annual average as that of Saint Paul, which would give it a winter mean of 15 degrees and an annual mean of 44 degrees, which represents the climate of Wisconsin, northern Iowa, Michigan, western Canada, northern New York, and southern New England.

But though the winter of this region is a period of intense cold, during which the mercury often remains frozen for days together, its effect upon the physical comfort is mitigated by a clear dry atmosphere, such as makes the winters of Minnesota the season of animal and social enjoyment. The buffalo winter in myriads on the nutritious grasses of its prairies, up to as high a latitude as Lake Athabasca. The half-breeds and Indians camp out in the open plain during the whole winter, with no shelter but a buffalo skin tent, and abundance of buffalo robes, and the horses of the settlers run at large all winter, and grow fat on the grasses which they pick up in the woods and bottoms. As compared with Fort Snelling, the winter of the Red river settlement will be shown as follows, including the months of November and March in the natural winter group.

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	November.	December.	January.	February.	March.
	° ′	° ′	° ′	° ′	° ′
Red River,	21 19	8 31	10 55	1 71	9 9
Fort Snelling,	31 7	16 9	13 7	17 6	31 4

15. Red River Spring.

Spring opens at nearly the same time from Saint Paul to Lake Athabasca. April and May are the natural spring months of this whole climatic belt. The abruptness of the transition from winter to spring in these northern latitudes is a wonderful feature of the climate. In the Red river settlement the mean of March is 9° 9′. In April it rises to 39° 83′ and in May to 58° 46′. Compare this with the springs of Minnesota and western Canada.

	March.	April.	May.
	° ′	° ′	° ′
Red River,	9 9	39 83	58 46
Fort Snelling,	31 4	46 3	59
Toronto,	23	42 27	50 52

16. Agricultural Capacity of the Summer Months.

This rich upward swell of the spring temperature is prolonged through the summer months of June, July and August, to include the amplest measures of heat for all agricultural purposes. Corn thrives well at a mean temperature of 35 degrees for the summer months, requiring however a July mean of 67 degrees. Wheat requires a mean temperature of from 62 to 65 degrees for the two months of July and August. These two great representative staples of American agriculture carry with them the whole procession of useful flora that characterize the northern belt of the temperate zone. Now the mean temperature of Red river for the three summer months is 67° 76,′ nearly three degrees of heat more than is necessary for corn, while July has four degrees of heat more than is required for its best development. The mean of the two months of July and August is 67 degrees; five degrees above the requirement of wheat.

The following figures will show at a glance the excess of summer heat in the Red river valley above the measures required for the best agricultural development.

Mean summer temperature of Red River,	67.76	
Required for corn,	65	
Excess,		2.76
Mean temperature of July,	71.16	
Required for corn,	67	
Excess,		4.16
Mean temperature of two months of July and August,	67	
Required for wheat,	62	
Excess,		5

The following table will serve for comparison between the summer temperatures of the Red river with the rich agricultural climates of the south.

	June.	July.	August.	Summer mean.
Red River,	69 10	71 16	63 3	67 76
Fort Snelling,	68 4	73 4	70 1	70 6
Chicago,	62 7	70 8	68 5	67 3
Muscatine, Iowa,	66 4	70 5	68 9	68 6
Kenosha, Wisconsin,	61 7	68 6	65 7	65 3
Utica, N. Y.,	64 2	68 5	66 7	66 5
Toronto,	59 93	67 95	64 0	63 98

It will thus be seen that the summer climate of Red River is warmer than that of any of the localities indicated in the above table except Fort Snelling and Muscatine, Iowa; warmer than that of northern Illinois, western Wisconsin, northern New York, or western Canada. Its June is warmer than in any of the points given, its June and July warmer than any except Fort Snelling, while its Augusts are cooler than any of the rest. The last named locality in the same

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latitude as the Red river settlement with a corresponding geographical position is its equivalent in annual mean temperature, but the difference between the extremes of summer and winter temperature is much less in the interior European than in the American plain. No part of the United States has so low an annual mean. Fort Kent, Me., with a mean of 37° is its nearest approach.

17. Autumn.

The mean temperatures for the autumnal months are as follows, compared with Minnesota.

	September.	October.	November.	Mean.
Red River,	59 26	42 20	21 19	40 88
Fort Snelling,	58 9	47 1	31 7	45 9

November, which in Minnesota belongs partly to autumn and partly to winter, belongs entirely to the winter season in the more northern latitude of Red river. The reader will see that the fall plunges into winter almost as rapidly as the spring emerges from it.

18. Climate of the Red River Settlement compared with Minnesota, Wisconsin and Michigan.

The following table will illustrate the climate of the Red river valley as compared with other and better known latitudes.

Table of Monthly Means of Red River and Minnesota, Wisconsin and Michigan.

	Red River.	Fort Snelling.	Green Bay.	Detroit.
December,	8 31	16 9	20 8	26 9
January,	10 55	13 7	18 9	27
February,	1 71	17 16	20	26 6
March,	9 09	31 4	31 3	35 4
April,	39 83	46 3	43 4	46 3
May,	58 46	59	55 8	56
June,	69 10	68 4	66 2	65 6
July,	71 16	73 4	71 5	69 7
August,	63 3	70 1	67 9	67 5
September,	59 26	58 9	57 2	60
October,	42 20	47 1	46 5	47 7
November,	21 19	31 7	34 3	38 2

Table showing the Means of the Seasons for the above localities.

	Winter.	Spring.	Summer.	Autumn.	Annual Mean.
Red River,	6 85	35 79	67 76	40 88	34 38
Fort Snelling,	16 1	45 6	70 6	45 9	44 6
Green Bay,	19 9	43 5	68 5	46	44 5
Detroit,	26 8	45 9	67 6	48 7	47 2

Thus it will be seen that while the winter curve in the region immediately south and west of the Great Lakes exhibits an extraordinary depression, its rich summer measures place it in the best agricultural belt of the temperate zone.

20. Bountiful Summer Rains.

We shall have occasion to speak of the Saskatchewan valley as a singular exception to the almost universal sterility which characterizes the continent west of the 98th meridian. The great American desert derives its barrenness from the lack of rain.

The Winnipeg Basin, on the other hand, is abundantly supplied with moisture during the summer months, although the dryness of the winter months reduces the mean annual precipitation below that of points lying nearer the oceans.

No rain tables have ever been constructed for any portion of this district, except for the single year 1855, at the Red River settlement. The following table exhibits the results compared with Minnesota and Western Canada.

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Rain in Inches.

	Red River, 1855.	St. Paul, 19 years.	Toronto, 1855.
March,	.65	1.30	1.62
April,	6.80	2.14	2.79
May,	4.	3.17	4.78
June,	6.	3.63	4.07
July,	12.	4.11	3.24
August,	12.5	3.18	1.45
September,	5.	3.32	5.9
October,	.20	1.35	2.48
November,	3.12	1.31	4.89
December,	.80	.67	3.80
January,	.50	.73	1.36
February,	.60	.52	.97
	52.17	25.43	36.35

Means for the Seasons.

	Red River.	St. Paul.	Toronto.
Spring,	11.45	6.61	9.19
Summer,	30.5	10.92	8.76
Autumn,	8.32	5.98	13.27
Winter,	1.90	1.92	5.13

By multiplying the figures for November, December, January, February and March, by 10, the result will show the fall of snow, probably the actual form of the precipitation in those months.

The column for Red river exhibiting the moisture of a single year, can not be adopted as the uniform measure of precipitation in that country; but if, as Blodgett informs us, a difference of one-eighth will cover the range of any non-periodic variations of the rain-fall in the basin east of the Rocky mountains, (a rule that is confirmed by a comparison of the Toronto column, for the same year, with the means for several years given in his work,) it may serve as an approximative index to the rain standard of the country. The excessive rains of that summer, which has no equivalent on the continent, except the winter rain of the Pacific, is probably much beyond the uniform mean, or if, regarded as an approximation to a constant term, may be accounted for by its contiguity to Hudson's Bay and Lake Superior.

A region liable to such occasional rains, can not certainly be deficient in moisture. The reader will observe the great preponderance of moisture in the spring and summer months, with the extreme dryness of the winter. Converted into snow, the whole winter fall will be 22 inches, the same as at Saint Paul, while that of Canada is 61 inches, and most of the eastern states 120 inches. This extreme lightness of the winter precipitation characterizes the whole of the plains east of the Rocky Mountains, without reference to latitude—including the Saskatchewan valley, and is a fact of great importance in determining the adaptability of those regions for railroads.

We have no measurements of the local precipitation of the Saskatchewan valley, but the general fact of a comparatively humid summer, with an autumn and winter of extreme dryness, is well ascertained.

The rain measures in the elevated belt of country, including the western slope of the Missouri plateau, adjacent to the Saskatchewan valley on the south, will afford an approximative standard for the latter. The following table, compiled from Blodgett, will exhibit the rain fall in the whole belt across the continent, between the parallels of 47° and 50°.

Rain Table showing the mean annual precipitation between 47th and 50th parallel.

In Vancouver Island,	65 inches.
Western slope of Rocky Mountains,	30 "
Eastern, " " "	25 "
Missouri Plateau to 100th Meridian,	20 "
Between Red River and 100th Meridian,	25 "
East of Red River to Lake Erie,	30 to 34
West of Lake Erie to the Atlantic,	36 inches.

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Mean Fall by Seasons.

Winter Fall.	Spring Fall.	Summer Fall.	Autumn Fall.
30	15	8	20
5	6	6	6
4	6	6	4
2	5	6	4
2	5	6	4
3 to 5	6 to 8	10	6 to 10
5 to 10	6 to 8	10	10

A fall of six inches is given by Blodgett, as the mean for the summer in this belt, between the Rocky mountains and Red river. This is amply sufficient for all the purposes of luxuriant vegetation, as is shown in southern England, Prussia, the Crimea and interior Russia.

But according to all analogies, the higher summer temperature of the Saskatchewan valley would be accompanied by a corresponding increase of humidity, and this fact is further shown by the permanent volume of its streams in the summer months.

21. Agricultural Capacity of the Winnipeg Basin.

For all the great northern staples, wheat, corn, oats, barley, potatoes, sheep and cattle, the range and duration of the summer heats form the decisive condition. The data we have furnished prove conclusively the climatic adaptation of the Red river and Saskatchewan valleys, to successful agriculture.

Indian Corn.—The measures of heat, as we have before shown, are ample for the development of corn, in this district, and, in fact, some varieties thrive well at the Red river settlement, but it is not claimed as a profitable staple. It is cultivated chiefly in small garden patches for the green ears, but the cool nights of August frequently prevents its ripening, except in the dryest soils. Some varieties of Canadian corn, requiring a growing period of not more than seventy days, would, however, form a sure crop in Red river.

Indian corn, indeed, according to Blodgett, is restricted as a profitable staple to the middle region of the west, between parallels of 42 and 43°.

Wheat.—Wheat is the leading staple of the upper belt of the temperate zone. The range of wheat extends from the borders of the tropics northward of the parallel of 60° north—and requires a minimum mean temperature of 62 or 65° for the two months of July and August. The whole region between the Red river and the Rocky mountains, is embraced between the mean summer temperatures of 65 and 70°, which include also the most fertile districts of New England, New York, Pennsylvania, Michigan, Wisconsin and Minnesota.

Between these isotheral lines, extended through these northwestern valleys to the Pacific, is embraced the wheat zone of the continent. "A line," says Blodgett, "drawn from Thunder Bay, in Lake Superior, northward, to the Mackenzie, at the 60th parallel, and from that point southwest to the Pacific coast, at the 55th, would include an immense region adapted to wheat, with only the local exception of mountains and worthless soils."

Richardson states that wheat is raised with profit at Fort Liard, latitude 60° 5′ north, and longitude 122° 31′ west, and 400 or 500 feet above the sea.

The remarkable law has been observed to govern the development of the cultivated plants, that they yield the greatest product near the northernmost limits of their possible growth.

This principle, announced by Forrey, is noticed by Blodgett, as especially applicable to wheat. Central Russia, the Baltic districts, the British Islands, the Canadas, and the northern parts of New York and Pennsylvania, and the upper belt of the northwestern states lying upon the cold borders of the wheat range, are the seats of its maximum production.

"Probably," says Blodgett, "the plains of the Saskatchewan, and the Pacific coast near Puget's sound will furnish similar districts. This, *a priori* inference is fully borne out by facts, which prove, moreover, that the basin of the Winnipeg is the seat of the greatest average wheat product on this continent, and probably in the world.

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The limestone substratum of this region, with its rich, deep, calcareous loam, and retentive clay subsoil, is always associated with a rich wheat development; while its hot and humid summers fulfill all the climatological conditions of a first-rate wheat country.

Instances of the Wheat product of Red River.—"Our soil," says Donald Gunn, an intelligent settler, "is extremely fertile, and when well cultivated, yields large crops of the finest wheat, weighing from sixty-four to seventy pounds per imperial bushel. The yield per acre is often as high as sixty bushels, and has been occasionally known to exceed that, and when the average returns fall below forty bushels to the acre, we are ready to complain of small returns. Some patches have been known to produce twenty successive crops of wheat without fallow or manure."

Professor Hind, in his official report to the Canadian legislature, sets the average product at forty bushels to the acre. He notices a product of fifty-six bushels to the acre, in the only instance when a measurement was made. Wheat ripens in from ninety to one hundred and five days. It is entirely free from insects or disease of any kind.

A comparison of the yield of wheat in Red river, with the best wheat districts of the United States, will show its superiority over all others.

Red River produces	40	bushels	per acre.
Minnesota, "	20	"	"
Wisconsin, "	14	"	"
Pennsylvania, "	15	"	"
Massachusetts, "	16	"	"

Oats, Barley, Rye, Potatoes.—The whole group of subordinate cereals follow wheat, but are less restricted in their range, going five degrees beyond wheat in the Mackenzie valley to the arctic circle. Barley is a favorite alternate of wheat at Red river, and yields enormous returns, with a weight per bushel of from forty-eight to fifty-five pounds. Oats thrive well. Potatoes are particularly distinguished for their excellent quality and large yield.

Hay.—"The grasses," says Forrey, "are proverbially in perfection only in northern and cool regions. It is in the north alone that we raise animals from meadows, and are enabled to keep them fat and in good condition with grain."

In none of the Prairie districts of North America, are the native grasses so abundant and nutritious as in these northern valleys. This is sufficiently proved by the countless herds of Buffalo that pasture throughout the year upon its plains, even up to the latitude of Peace river; a fact which suggests an equivalent capacity for the herding of domestic cattle.

The Red river colony, in 1856, contained 9,253 horned cattle, and 2,799 horses, which, in a settlement of 6,523 souls, exhibits a remarkable proportion of stock. Horses roam during the summer and winter through the woods, and keep fat without housing or hay. The unlimited pastoral ranges afforded by the grassy savannahs of Red river, with its dry winter climate, seem to supply favorable conditions for successful sheep husbandry. This is confirmed by Donald Gunn. "Our climate and soil," he says, "are peculiarly adapted to sheep. There are twenty-eight years since their introduction into the settlement, and I have never seen nor heard of any sickness attacking them. Well-fed ewes produce fleeces varying from two to three and a half pounds. Wethers produce fleeces much heavier. The wool is of good quality, though not very fine." An inferior breed of sheep would not be likely to produce fine wool.

21. Mineral Resources.

The simple geology of the country, an uniform base of limestone, of the Silurian group affords, of course, but little development of the useful minerals, except upon the borders of the district.

Coal.—Coal used in the forges at Fort Edmonton, is found in the eastern slope of the Rocky mountains, for a width of 150 miles across the whole western end of the Saskatchewan valley, and extending far into the Mackenzie valley, and beds of coal (lignite) have been found onthe Mouse and Assineboine rivers.

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Salt.—On the shores of Lake Manitoba, west of Lake Winnipeg, are found some of the richest brine springs in the world, and a considerable quantity is made by the settlers. In a dry season twenty-four gallons of brine produce one bushel of good salt, or 33⅓ per cent. The salt commands ten shillings per bushel at the settlement. These salt springs occupy a large district of country south and north of the 49th parallel, estimated at 14,000 square miles. The great salines of the Athabasca valley, are prominent on the northern borders of the country.

23. Commercial History of the Hudson Bay Company.

Nearly two hundred years ago the English and French were competing on the shores of Hudson's bay for the fur traffic with the Indians who inhabited the basin of Lake Winnipeg. Obliged by the conditions of the treaty of Utrecht, in 1714, to surrender these shores to the Hudson Bay Company, the French confined their attention to the new channel of trade which the great lakes opened out to them, and, pushing their enterprises west of Lake Superior, established trading posts on the Lake of the Woods, the Assineboine, and even on the head waters of the Saskatchewan.

In 1763, by the terms of the treaty of Versailles, the French relinquished their North American possessions to England, and British subjects, following the old French routes, began to occupy their deserted posts, and even to compete with the Hudson Bay Company for the trade which they then pursued on the rivers which debouch into Hudson's bay.

Uniting against this corporation, regarded as the common enemy, the principal of these traders formed, in 1783, a powerful business organization under the name of "The North-west Company." This company pushed their lucrative traffic, via the lakes, from Montreal to the shores of the Pacific; carrying their furs in fleets of canoes, through the connected chain of rivers and lakes, across the whole breadth of the continent.

In 1811 the Hudson Bay Company, at the instance of Lord Selkirk, set up a claim of exclusive jurisdiction over this immense region, and in 1812, they established a fort on Red river, and Lord Selkirk planted his colony under its protection. A savage contest followed between the rival companies, which was terminated in 1821 by their coalition under the name of the Hudson Bay Company, which has since, until recently, held the country under a rigid monopoly, and exercised all the powers of government.

The company founded their claim of exclusive trade and civil jurisdiction in this country primarily upon a charter granted by Charles II, of date 1670, covering all the water slope of Hudson's bay; and next upon a tenure of exclusive trade granted in 1838, for twenty-one years, and applying to the rest of ultra-colonial British America.

The immense system of lakes and rivers, ramifying through the whole upper half of North America, and centralizing, by easy accesses from every part of the fur-bearing zone, in this central basin of the Winnipeg, with its Atlantic outlets and its comparatively genial climate, peculiarly adapt it to the traffic in furs.

Throughout this region the Hudson Bay Company have established thirty-three trading posts, two or three hundred miles apart, along the streams. The furs collected at these posts on this side of the Rocky mountains are transmitted for thousands of miles in barges and canoes, through the lakes and rivers of the arctic water system and down the Saskatchewan to Lake Winnipeg, whence, till recently, they have been carried through the precipitous rivers which debouch into Hudson's bay, at Fort York. A single ship arriving here in July or August, with the supplies of the succeeding year, received the annual product of furs for the depot of the company in London.

This difficult and secluded route, broken by innumerable portages, with its arctic outlet closed by ice for ten months of the year, was preferred to the old route, through Lake Superior, pursued for a century by the French and north-west traders, apparently because it enabled the Hudson Bay Company to conceal the value of the trade they wish to monopolize, while it gave them the exclusive command of the sole existing means of communication with the

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markets of supply, thus affording a powerful check on the rising colony of Selkirk; and, moreover, by shutting up the old avenues to Canada and the United States, prevented an intercourse which must have proved injurious to their interests.

They could not, however, prevent the jealousy with which their lucrative traffic was regarded in Canada, nor the discontents which were brewing in the Scotch colony of Red river.

This colony was planted by Lord Selkirk in 1812, at the mouth of the Assineboine, as an auxiliary to the extension of the Hudson Bay Company's trade, as a source of agricultural supply, and as a check to their rivals of the North-west Company.

This heterogenous community constituted a distinct municipality, under the government of the company, and subject entirely to the arbitrary restraints which their authority imposed on the freedom of traffic. It was natural that the discontents occasioned by the oppressive regulations of the company should lead to an examination of the foundations of their authority. Grave doubts arose as to the validity of their charter. Eminent legal advice confirmed these suggestions. Enterprising colonists were not wanting to give a practical solution to the question. Independent traders sprang up. Canadian and American intruders established themselves in the settlement. The company was defied. They shrank from a judicial test of their pretended rights, and after some abortive efforts to preserve their authority were obliged to relax the stringency of their regulations.

Their license of exclusive trade expired on the first of June, 1859. A powerful movement, originating in the local disaffections of the colony, was formed in Canada in 1856 and 1857, to prevent the extension of their license. As the discussion continued the people of Canada began to appreciate the immense value of the country stretching from their borders to the Rocky mountains, and to demand its annexation. The public opinion of the United States and of England began to share in the movement. A parliamentary investigation was ordered. The world was suddenly astonished to find that a region as large as both the Canadas, and equalling them in natural resources, lay behind the rugged and icy curtain of Labrador and Hudson's bay, locked up in the heart of the temperate zone, the stolen secret of a few fur traders.

The discovery of gold upon Frazer's river invested the discussion with a world-wide interest. The license was not renewed. A new colony was formed on the western slope of the Rocky mountains, under the name of British Columbia. The scheme of a British railway to the Pacific was revived. A change of ministry was all that prevented the consummation of Bulwer's grand project of a chain of colonies from Canada to the Pacific.

23. The Commercial Outlets of the Country.

Attempted route north of Lake Superior.—Having procured a partial removal of the company's restrictions upon the freedom of traffic, the Canadian people were anxious to reap its advantages, and for this purpose made an energetic effort to reopen the old channel of intercourse between Canada and Rupert's Land, followed for a hundred years by the French and North-west Company, through Rainy Lake river and the great lakes. The route was explored under the auspices of the Canadian government, and companies were chartered to open it. A steamer carrying a semi-monthly mail between Sarnia and Fort William was all that came of these efforts. The route did not answer the expectations of its friends.

Development of the Minnesota route.—Long before the Canadian agitation a new direction had been given to the fur traffic of the Red river colony, which obviated the difficulties of the old routes through Hudson's bay and Lake Superior. This was the route by the Red river and Mississippi valleys to Saint Paul.

The first recorded journey from the Red river to the Mississippi, undertaken with a commercial object, was in 1820, when the exigencies of the Red river settlement obliged them to procure supplies of seed from Prairie du Chien. The voyage was accomplished in Mackinac boats, all the way by water except

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the narrow portage between Big Stone lake and Lac Traverse. Droves of cattle, too, were frequently brought over this route to be sold in Mendota. But it was in 1844 that the first regular commercial communication was opened on this route, when Norman W. Kitson, of St. Paul, established a trading post at Pembina, on the edge of the company's jurisdiction, but within American territory.

The first years of this single-handed competition with a corporation which, in a history of two hundred years, had worsted all its rivals, gave little promise of the success which at a later period attended its prosecution.

The amount of capital invested in the first venture was only about $2,000, with a return in furs of only $1,400. The next two years involved a similar loss. From this time, however, the increasing stream of trade began to turn in the direction of the approaching settlements of the Mississippi valley, the transportation being accomplished by carts drawn by oxen or horses, and carrying each about 700 lbs. weight. Hundreds of these carts, laden with furs, annually followed the smooth prairie trails from Red river to St. Paul, until last year, when they were partially superseded by the introduction of steam navigation on Red river.

The following table, prepared from various sources of information, will exhibit, approximately, the increase of the receipts of furs at St. Paul from that source.

1844,	$1,400.	1856,	$ 75,000.
1845,	3,000.	1857,	100,000.
1846,	5,000.	1858,	100,000.
1850,	15,000.	1859,	100,000.
1855,	40,000.		

Of these carts a large number came from the British side. In 1857, Donald Gunn, of Red river, estimates that three hundred carts went from that settlement to St. Paul; the return loads being valued at $150, each, or $45,000, in all. In 1858, four hundred came from that side. The return loads are generally of American merchandise, and are paid for, to a considerable extent, by direct outlays of money, which would probably add seventy-five per cent. to the whole receipts from that source for the last three or four years.

This rapid growth was achieved, not only against the most persistent efforts of the company to arrest it, but in spite of a serious fiscal obstacle; an American duty of twelve and one-half per cent., levied on all furs of British manufacture, and a British local duty of four per cent., levied on all goods imported. whether of American or British origin.

24. The New Policy of the Hudson Bay Company.

Preference of the American route.—With the expiration of their license of exclusive trade, their charter privileges defied by hordes of private adventurers, their trade tapped at its natural outlet by American competition, the Hudson Bay Company found it necessary to shape their policy in accordance with the imperious dictation of events.

Instead, therefore, of pursuing a useless quarrel against all the world, all the energies of its strong and disciplined organization were directed to meet its antagonists on the field of free competition. To do this it was necessary to remodel their whole system of transportation, upon the basis of the cheapest and most expeditious modes and routes of travel. The first step in this policy was the abrupt abandonment of the difficult and expensive channel of transportation to Hudson's bay, for the more economical and safer route through Minnesota, in the direction indicated by the natural affinities of the country.

The extension of railroad communication through the United States to the Mississippi river, in the direct line from St. Paul to New York, with the alternative of a continuous water line from Chicago to the Atlantic, and the recent introduction, by American enterprise, of steam navigation upon Red river, gave this route decided advantages over the traditional British outlets.

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25. A Detailed Comparison of Outlets.

A comparison of the distances, modes, cost and time of transportation, over the different available routes, will exhibit the decided advantage of the Minnesota route over all others.

(1.) *Hudson Bay Route.*—This is a barge route, lying through Lake Winnipeg, and a broken chain of small rivers and lakes, of which Hill and Hayes rivers are the principal connections, crossing a wide belt of primitive rocks and debouching into Hudson's Bay, at Fort York, at a distance from Fort Garry of 745 miles. 363 miles of this to Norway House, on Lake Winnipeg, is uninterrupted navigation; thence to Fort York, the precipitous water-line is broken by 34 portages, at each of which the batteaux used in transportation have to be unloaded and their cargoes packed across upon the backs of the boatmen. On this account the goods of the company are put up in packages of 90 lbs. each. Each boat carries five tons, and is manned by seven men. Two trips are made during the season of four months, commencing June 8th and ending Oct. 15th. The expense of manning each boat for the season is stated at $1,250 for wages and maintenance, about $625 for each trip; or $125 per ton of freight.*

The numerous rapids make navigation extremely dangerous and difficult. The perils of the passage do not cease at Fort York. Hudson Bay is closed with ice for more than ten months of the year, while the short interval of navigation is extremely precarious from the numerous rocks, shoals and islands which encumber it.

Its situation is moreover isolated from all the channels of continental intercourse, and makes London the nearest accessible market. One or two ships monopolize the transit to Europe. Goods shipped from England by this route do not reach their destination for a year. Orders for goods require two years to be filled.

The freight per ton paid by the Hudson Bay Company upon this route were as follows:

From London to York, ...	$30.00
From York to Red River, ...	125.00
	$155.00

The settlers paid $162 per ton for freight from Fort York to Red River, and over $200 per ton from London.

(2.) *The Lake Superior Route.*—This route traverses a series of granitic ridges, elevated some 1,400 feet above Lake Superior, and forming the divide between the waters of that lake and those of Lake Winnipeg and Hudson Bay. The Winnipeg river, Lake of the Woods, Rainy Lake and river and Pigeon or Kaministiqua river, form a broken chain of water communication for canoes and barges across this mountain barrier, between Lake Winnipeg and Lake Superior. This was the route pursued for over a hundred years by Canadian fur traders. In a distance of 771 miles from Fort Garry to Fort William, it involves 60 portage transhipments, practicable only for small canoes. The shortest and best ascertained route by this water chain, gives a distance estimated by Prof. Hinds, at 647 miles from Fort Garry to Fort William, involving 50 portage transhipments. 412 miles of this, from Fort Garry to Rainy Lake, is said to be practicable for small barges of 2 1-2 tons; the remainder of the distance to Lake Superior requires canoes.

The construction of a corduroy road over 116 miles of swamp, from the northwest corner of the Lake of the Woods to Fort Garry, would diminish the through distance to 502 miles, but would scarcely be regarded as increasing the facilities of transportation. The navigation is exceedingly dangerous except to practiced boatmen. As this route involves more portages and less slack-water navigation than the Hudson Bay route, the cost of transit can not be less than by that. According to Sir Geo. Simpson it is twice as much. On a load of flour shipped by this route, by the Hudson Bay Company, $225 per ton were paid.

(3.) *Minnesota Route.*—Obviating all the difficulties and dangers of navigation upon these mountain streams, the smooth adjacent plains of the Red river and Mississippi valleys afford an unlimited choice of the best natural highways in the world, by land or water, or both, without restriction as to the means of transportation.

* Sir John Richardson.

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Old Trails.—The overland routes which have been heretofore used lie generally over dry and level prairie tracts, crossing numerous small streams fringed with timber. One class of these land trails, guided at will over the level uplands, follows the western slope of the Red river, crossing that river at Fort Abercrombie, and the Mississippi at St. Cloud, with a distance over the old trail of Capt. Pope, of 533½ miles from Fort Garry to St. Paul. Another track leaves the Red river at Pembina and enters the Mississippi valley at Crow Wing, with a distance to St. Paul from Fort Garry of 482 miles, according to Col. Smith. A distance of forty miles might be subtracted from either of them.*

Over these smooth roads the settlers transport their goods in imposing caravans of carts, drawn by oxen or horses, and numbering frequently five or six hundred in a single procession. These carts cost about $15 each; and carry about 700 lbs. weight each. Twenty days is occupied in the journey down. These cart tracks may however be regarded as nearly superseded for the purposes of transportation by a new line of conveyance opened last summer. The events of last year have made them obsolete.

The New Steamboat and Wagon Routes.—Lying directly upon the route from Fort Garry to St. Paul, there are long reaches of navigable waters, available for the most efficient forms of steam transportation. The Red river carries a navigable water line of 476 miles south of Fort Garry into Minnesota, equal to 300 miles of land route. 155 miles of smooth land travel connects the Red river with another stretch of steamboat navigation, between St. Cloud and St. Anthony, a distance of 89½ miles, equal to 69 miles of the land route; 14 miles of water, or eight and-a-half miles more of land conveyances completes the distance to St. Paul.

In the summer of 1859, a little steamboat of 60 tons burthen was placed by the enterprise of the citizens of Minnesota upon the Red river, and steam navigation is now successfully developed upon 579 miles of the water route—equivalent to a deduction of 370 miles from the land route, leaving only 155 miles to be accomplished by land carriage. The cheaper and speedier modes of transit of which this route is capable, must supplant the long-worn cart trail, till the track is laid with iron rails, and trains of laden cars recall the picturesque caravans of the voyagers.

The statistics of distances upon these different routes from Fort Garry to St. Paul, may be recapitulated as follows:

	Miles.
1. *Old Cart Routes.*—Plain trail via Fort Abercrombie and St. Cloud to St. Paul,	533½
Plain and wood trail via Otter Tail Lake and Crow Wing to St. Paul,	482

2. *New Steamboat and Wagon Route.*—Fort Garry to Abercrombie on Red River,	Miles by water. 450	By land. 293
Fort Abercrombie to St. Cloud, Land Carriage,	155	155
St. Cloud to St. Anthony,	89½	70
St. Anthony to St. Paul,	14	8½
	708½	526½

As to time and cost of transit, the round trip by the old cart routes employs usually from 40 to 60 days, at a cost for freight carried of $90 to $100 per ton. If the carts are loaded both ways, the freight would be reduced to half this. By the new route goods may be carried to Red river in 15 days, or in 30 days for the round trip, to and from St. Paul, at a cost of $55 per ton, and when the through transit is thoroughly organized the trip can be made in 12 days at a cost of $40 per ton. This does not express the actual charges for transportation, but the primary cost. The elements of the primary cost of transportation by Red river, carts to Pembina are thus given by Messrs. Farrington & Culver, fur traders of St. Paul.

Four carts carrying 800 pounds each require, by the Red River mode of traveling, but 4 oxen to haul them and but one driver.

Four carts at $15 each, will cost $60 and will last for three trips.

* *Vide* a table of these routes and their intermediate distances in the appendix.

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Four oxen at $50 each cost $200, and require no feed but the wild grass of the country, and about $5 per head for keeping them throughout the year at Pembina. The cost of round trip for four carts will then be as follows:

Wear of 4 carts, one-third of cost,	$20
Wages of one man, 2 months at $20,	40
Provisions,	10
Interest on cost of outfit at 10 per ct.,	26
Loss on oxen 3 per ct. of cost $200,	6
Keeping cattle, $5 per head,	20
	$122

Total freight carried by 4 carts, 3,200 lbs. Cost per ton for full freight of carts loaded both ways, $38.00

Cost per ton when loaded only one way, 76.00

The actual cost per ton by the steamboat and waggon line will be about as follows:

From St. Paul to St. Anthony, half a day for a team,	$2.00
From St. Anthony to St. Cloud, steam,	5.00
From St. Cloud to Georgetown, team,	20.00
From Georgetown to Fort Garry, steam,	10.00
	$37.00

In the present imperfect organization of this route, the charges for transportation are more than double the above sum. A few years of competition, with business enough to ensure a thorough organization of the transit, will reduce the charges to the ordinary rates of transportation expressed in the above table.

The completion of the contemplated railroads to Red river, will reduce the cost of transportation per ton to the following figures, assuming the ordinary rates of western railroad and water transit on short lines.

St. Paul to Breckenridge, 238 miles, at 4 cents per mile.	$9.32
Breckenridge to Fort Garry, at 50 cents per hundred,	10.00
Cost per ton of transportation from St. Paul to Fort Garry,	$19.32

The following table will exhibit the comparative advantages of the Minnesota route, in its present state, over the old canoe routes, assuming Fort Garry as the starting point:

	Distance. Miles.	Transhipments.	Vehicles. Barges.	Cost per ton.
1. To Fort York, Hudson Bay, via Hill and Hayes River,	745	34	5 tons.	$155
2. Fort William, Lake Superior, via Winnipeg and Rainy Lake and other rivers, *old route*,	771	60	canoes.	225
By Hind's Route,	647	50	canoes.	
3. St. Paul (1,) via Cart route,	482	none.	carts,	96
(2,) Land and Water,	703	3	Steamboat and Wagons.	37

A marked advantage of this route, too, is, that it passes through a chain of nearly continuous settlements, from the Mississippi to Red river—an important condition of a system of organized transportation, of which the British routes are physically incapable.

Above all, Minnesota possesses the pre-eminent local advantage of furnishing accessible markets of exchange nearer by 3,000 miles than the Hudson Bay route and by six hundred miles than the Fort William route.

From her easy communications with the Great Central Railroad and Steamboat lines of inland transit, goods received from London can be laid down at St. Paul, very much more speedily and cheaply than at Fort York.

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The cost of transportation per ton from London, compares as follows:

To Fort York,	$30.00
To St. Paul, via railroads, 1st class freights,	34.33
Via canals and lakes,	18.00

Hudson Bay Company's Transportation by the Minnesota Route.—The Hudson Bay Company were among the first to avail themselves of the advantages of cheap, speedy and safe transit, which this route afforded. In 1858, before the introduction of steam upon the Red river, the Company sent 60 packages by this route. In 1859, over 50 tons were forwarded through the same channel, and formed a part of the first freight carried by the little steamer in Red river. Satisfied with the results of these experiments, the company have made arrangements with Messrs. Burbank & Co., of St. Paul, to forward their entire supplies for the Red river trade, amounting to from 250 to 500 tons annually. The development of steam communications on Lake Winnipeg will transfer the whole transportation of the trade to Minnesota.

27. Commercial Resources of the Country.

(1.) *Present Productive Resources.*—Thus the spring of 1850 finds Minnesota quietly established by the resistless pressure of physical laws upon the movements of the day, in her natural position as the chief commercial entrepot of the great intermontane region of British America, 200,000 square miles in extent, and stretching from the Missouri river to the Arctic sea.

The present value of the commerce which nature has thus made tributary to Minnesota, is almost solely in its fur product. Three-fourths of this whole region, embracing all of western British America, except the agricultural belt already described, is fitted by nature solely as the abode of fur-bearing animals. A very large proportion of the North American furs imported into England, for European consumption, are brought by the Hudson Bay Company, from Rupert's Land. Vide the table following.

Table of imports into London, of Furs and Skins from the Hudson's Bay Company, and the United States, for one year from September, 1856, to September, 1857,—considered a bad year.

	Hudson's Bay Company.	United States.
Muskrat,	302,131	862,330
Beaver,	90,604	8,594
Otter,	11,573	4,368
Fisher,	5,561	4,025
Silver Fox,	7,071	477
Cross Fox,	3,143	1,608
Red Fox,	10,498	44,588
White Fox,	4,940	1,657
Kitt Fox,	5,776	5,366
Martin,	170,956	15,399
Mink,	45,091	78,510
Sea Otter,	188	167
Lynx,	23,341	824
Black Bear,	7,483	3,313
Brown Bear,	942	116
Gray and White Bear,	769	
Raccoon,	1,894	476,022
Wolf,	9,831	41
Wolverine,	916	25
Skunk,	7,740	209
Wild Cat,	184	6,973

In this table, buffalo robes, of which tens of thousands are annually collected by the company, are not numbered.

We have few materials for an accurate estimate of the value of the fur export of Rupert's Land.

The entire imports of the company for the supply of the trading ports east of

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the Rocky mountains, and mainly tributary to Minnesota, was stated by Sir Geo. Simpson, in 1857, at $200,000; $100,000 going to the supply of the Indians west of the Rocky mountains. According to an English authority, the gross value of the furs and skins exported to England, in return for the annual outfit, varies from $1,000,000 to $2,500,000. At the half yearly sale in April, 1857, held in London, the proceeds of the trade were stated to be $1,150,000. In March, 1856, the trade sales amounted to nearly $2,500,000. They sold then 80,000 buffalo robes at $12 each. The average annual export may be fairly stated then at $1,500,000, showing a return of 500 per cent. on the imports. $1,000,000 of this is the product of Rupert's Land, having its outlet through Minnesota.

Annual Exports and Imports of the Hudson's Bay Company, Estimated.

Imports.	
West of the Rocky mountains,	$100,000
East of the Rocky mountains,	200,000
Total,	$300,000
Exports.	
West of mountains,	$ 500,000
East of mountains,	1,000,000
Total,	$1,500,000

A statement made by Hon. Edward Ellice, a director of the company, corroborates the ratio of returns above presented. According to him, the annual nett profits of the company upon a capital stock of $2,500,000 are $327,865, besides a large sum which has gone to increase the capital. These profits are derived from the fur trade alone, which involves an annual outfit, according to Simpson, of only $300,000. If the above statement of gross exports be the true one, it shows that the expenses of collecting furs and inland transportation amounts to more than one-half of the whole value of the fur product.

(2.) *Present Available Resources of Trade.*

(*a.*) *Development of the Fur Trade.*—The Indian population east of the Rocky mountains, according to Sir Geo. Simpson, is 55,570 souls. And among these are annually distributed only $200,000 worth of goods, less than four dollars per head. It is easy to see in this inadequate supply of merchandise, the opportunity for a very profitable extension of the fur trade of Minnesota into these regions.

At the ordinary ratio of consumption by American Indians, the demand exists for four or five times the amount of goods above stated. The ordinary necessaries of the Indians are guns, blankets, cloths, powder, shot, lead, tobacco, axes, &c., amounting to an annual outfit for each Indian of at least $10, which will show a demand in that country, for the staples of the fur trade, of over $500,000, revealing a broad field for the enterprise of Minnesota.

The Hudson Bay Company has but fifty-one trading posts in all Rupert's Land, 1,077,000 square miles in extent, containing 42,800 Indians, and four or five thousand half-breed hunters. Many bands of Indians inhabit localities remote from the posts of the companies. Without attempting to suggest any scheme of competition with the Hudson Bay Company, it is obvious that the facilities of intercourse might be increased greatly to the enhancement of the product of fur. The policy of the Hudson Bay Company has been to repress all pursuits not directly auxiliary to their trade in furs. But the country is rich in commodities as available as furs for export. It is estimated that 150,000 buffaloes are annually slaughtered in the valley of the Saskatchewan and the adjacent American plains. Thousands of them are killed for their tongues alone, thousands more in the mere wantonness of sport, a considerable proportion goes to the making of pemmican and dried meat, while their skins are put to endless uses in the domestic life of the people, or are exported to foreign markets.

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But all these forms of consumption do not exhaust the value of the buffalo as a resource of commerce.

A buffalo will yield from thirty to seventy pounds of tallow, worth about ten cents per pound. If one third of the whole number annually killed could be made available for their tallow, 50,000 buffaloes would yield an average of fifty pounds each, or, 2,500,000 pounds of tallow, worth $250,000. The tongues, meat, &c., in the form in which they are prepared for domestic use in the country, might be exported on an extensive scale. The carcase of the fat buffalo, young and old, will average say 300 pounds of meat, which in the compact form of pemmican or dried meat, is worth six cents per pound, for exportation; 50,000 buffaloes will yield 15,000,000 pounds of meat, worth $900,000. If these commodities were sought for market, the carcase now left to rot or feed wolves upon the plains, would be worth $23 to the intelligent industry of the country, seven times as much as the hide for which it was slain.

We can not, of course, fix any such definite measure to the product of tallow, meat or hides, but it can not be doubted that if facilities for transportation were diffused through the country, they would form prominent staples of exportation. Not long ago a strong effort was made by the Red river settlers to engage in the lucrative trade in tallow. And at one time, 400,000 pounds was sent by them to Fort York, to be exported to England, but in consequence of the obstacles interposed to its shipment by the Hudson Bay Company, the attempt was discontinued. There is no reason, in the new circumstances of the country, why Minnesota should not draw from it, a product of tallow, meat and hides, equal to that of Northern Russia.

Mineral tar, salt, sarsaparilla, which grows in abundance all over the country, might be turned to the account of the trade with Minnesota, if the communications were thoroughly developed.

28. The Basis of a Minnesota Trade with the Red River Settlements.

The mineral and agricultural development of the country presupposes large communities. We are speaking now simply of the resources of trade available in the present state of the country.

The Selkirk Colony,—a Minnesota Market.—The foundation for an active commerce exists in the large and thriving settlement upon the Red river. Originally composed, in 1812, of two or three hundred Scotch emigrants, it has gradually expanded, by accessions of emigrants from Scotland, England and Canada, and the half-breed natives of the country, to a population of over 8000 souls, forming a settlement seventy miles in length, straggling in a single tier of houses and enclosures along the Red river and Assineboine. Broad differences of origin, language, religion and avocations, divide this community into two classes, nearly equal in numbers, occupying distinct divisions of the settlement, with the point of separation at the mouth of the Assineboine; one of farmers, Scotch and English in origin, Protestant in faith—the other, half-breed hunters of French paternity, and all Catholics. This community forms a distinct municipality under a governor and council, appointed by the company, whose jurisdiction extends over a circle of one hundred miles in diameter, with its centre at Fort Garry. The comparative statistics of this colony in 1843, 1849, and 1856, will show a rapid increase in the elements of wealth, in spite of the repressive influences which surrounded it.

Statistics of the Red River Colony.

	Population.	Houses.	Barns and stables.	Horses.	Cattle.	Sheep.	Pigs.
1843	5,143	730	1,291	1,570	3,897	3,569	1,976
1849	5,291	745	1,401	2,055	6,014	3,096	1,565
1856	6,523	922	1,902	2,799	9,253	2,429	4,674

	Ploughs.	Harrows.	Carts.	Acres under cultivation.	Wind mills.	Water mills.	Churches.	Schools.
1843					18	1		
1849	492	576	1,918	6,392½	18	1	7	12
1856	585	730	2,045	8,371	16	9	9	17

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The census of 1856 shows the fruit of its recent intercourse with the new American settlements in Minnesota, in the introduction of new agricultural machinery, and in freer commerce. Besides the implements above given, eight threshing machines, two reaping machines, six winnowing machines, one carding machine, and fifty-six merchant shops are among the innovations of the new epoch.

Value of property above described in 1856.

Dwellings,	$246,305
Live stock,	264,006
Implements,	29,990
Machinery,	16,885
Total,	$557,181

Growth since 1856.—Within the last four years the settlement has received a new impulse from American energy. Its rapidly-increasing intercourse with an American market has developed a spirit of enterprise among the people, new forms of industry, and a growing demand for American commodities.

The writer saw five reapers and numerous threshers in operation there in the fall of 1859. An agent for the sale of agricultural implements at Saint Paul informed me early in the spring that he had received orders for this class of articles amounting to $5,000. Two steam-saw mills had been erected; a steamboat had just been placed upon the Red river; a newspaper has since been established, ably conducted under the name of the "Northwestern." The population had increased, it was said, to nearly 9,000. Yet the settlement has been so long without a market that it is in almost universal want of a large class of articles esteemed necessary to the average *status* of American comfort. The people are universally intelligent and thrifty, eager to avail themselves of every opportunity to improve their condition. The proportion of schools and churches evince their social standing. The ordinary annual consumption of commercial staples bya community of this class would not certainly be less than that of an American community of the same numbers. The present annual consumption of goods in the settlement is said to be $100,000. We may safely assume that thrice that amount, or $300,000, will be consumed, with the facilities which are now offered for access to market with the commercial staples of the country.

28. Summary of the Resources of Trade.

The following statements will sum up the results of our inquiries.

Imports and Exports of Rupert's Land.

Imported by the Hudson Bay Company,	$200,000
By all others,	50,000
Total imports,	$250,000
Exports by Hudson Bay Company in furs,	$1,000,000
By all others in furs,	100,000
	$1,100,000

Available Resources of Trade.

Products of the country immediately available for exportation, in round numbers.

2,000,000 lbs. tallow, worth	$200,000
50,000 hides, worth	150,000
Cured meat and tongues, worth	900,000
	$1,250,000

Existing demand, based upon population, for increased importations.

Among 55,570 Indians receiving $3.59 per head, and requiring $10 per head, an increase is required of	$350,000
Among 10,000 whites and half-breeds, an increase is required of	200,000
	$550,000

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These figures of course are purely speculative and do not pretend to fix precise measures of quantity or value, but simply to present data for an intelligent estimate of the resources of the trade which nature has made tributary to Minnesota. Of the actual share of Minnesota in this trade we have few materials for a reliable estimate. Five or six hundred carts have annually visited Saint Paul for a number of years past from the Red river settlements, two-thirds of the number from the British side, the rest from the American posts at St. Joseph and Pembina. The British carts are generally empty on the downward trip, but they always carry back full loads of freight, mainly purchased with money.

Donald Gunn of Red river estimates the value of the return freights in these instances at from $125 to $150 per cart, or from $50,000 to $60,000 in all. The furs obtained at Saint Paul from Red river on both sides of the line are estimated at from $80,000 to $100,000 annually.

29. Natural Facilities of Internal Transit.

A prominent feature in the commercial physics of this northwestern country is the extent of its navigable water line, which may be taken as the natural exponent of the commercial value of its resources.

In the following table we give what is known of the continuous distances capable of steamboat navigation on the rivers which interlock in Lake Winnipeg.

Navigable Water Line and Shore Line of the Basin of the Winnipeg.

	Water line, miles.	Shore line, miles.
Red river from Breckenridge (mouth of Sioux Wood,) to Lake Winnipeg,	531	1,062
Tributaries of Red river.		
Red Lake river, (Minnesota,)	100	200
Assiniboin, (British territory,) uncertain navigation,	200	400
Lake Winnipeg,	264	782
Lakes Manitoba and Winnepegoos,	220	660
Saskatchewan river.		
From Lake Winnipeg to junction,	422	844
North branch to Edmonton,	540	1,080
South branch to Chesterfield House,	480	960
Total,	2,757	5,988

The sum of this series of distances forms a single continuous chain of navigation from within 224 miles of Saint Paul to the Rocky mountains. Subtracting the lateral deflections of minor streams, the trunk of these ramifying lines of communication has a length between its eastern and western extremities of 1,757 miles. The area drained by the system of rivers affording this amount of navigation is 360,000 square miles. The proportion of surface is therefore as 126 square miles to one of navigation, or as 60 square miles to one of shore line. Though this is only about one-half the proportionate shore line of the Mississippi valley, which is as one to 34.15 square miles of surface, the best watered region in the world, its superiority over districts regarded as peculiarly favored, will be shown by the following comparison.

Ratio of Surface to one mile of Shore.

Basin of Winnipeg,	60	square	miles.
Northern Lake region,	76	"	"
Mississippi valley,	34.15	"	"
Europe,	156	"	"
United States,	241	"	"

30. Effect of Steam in the Development of the Northwestern Trade of Minnesota.

The introduction of steam navigation throughout this extensive water line would revolutionize the whole traditional system of traffic with the Indians. It

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now costs the Hudson Bay Company annually $500,000 for the collection and transhipment of their furs. This will not appear extraordinary when it is known that the cost under the present system of transportation of maintaining a single batteau for the season of navigation, including the wages and provisions of men, is from $1,500 to $2,800.

One of these boats carries five tons. To make the upward voyage with loaded boats, from Lake Winnipeg to the Fort Edmonton, in the North Saskatchewan, a distance of 1,062 miles, requires a period of two months. A steamboat, which would carry one hundred tons, would make the trip in one week at the farthest, at a cost not greater than that required to support the batteaux.

To sum up this statement: To carry five tons, 1,000 miles, in a batteau, consumes the season, at a cost of $2,500, or $500, per ton. To carry one hundred tons in a steamboat, might consume a week, at a cost of say $1,000, or $10 per ton. Transportation by steamboat would, therefore, cost one-fiftieth of the expense by the present modes.

A reduction of ninety-eight per cent. on the cost of transporting one or two millions of merchandise, annually, offers a wide field of enterprise. Every step thus made in the reduction of the cost and time of transportation, extends the commercial sway of Minnesota in this direction.

The fur bearing animals, with their Indian hunters, would probably disappear in no long time before the press of competition, which these improved modes of communication would elicit, but with the exhaustion of these resources, the arts of civilization would already have begun to develop the more permanent and more valuable resources of the country.

As a proof of the importance of these natural facilities of transit, in the development of these new districts, it is to be remarked that the tendencies of settlement upon this continent are governed mainly by the direction of its navigable streams.

31. Theory of the Inevitable Concentration of the Emigrant Movement in this direction.

The future growth of Minnesota, as a commercial state, is closely identified with the progress of settlement and agricultural development in the broad belt of fertile lands lying north of the 49th parallel.

It has been alleged that the remoteness and seclusion of these imprisoned solitudes, and the inexhaustible areas popularly supposed to be available for agricultural settlement within the United States would postpone the development of the tract in question to a period too remote to have any immediate bearing upon the interests of Minnesota.

Now we propose to show, on the contrary, from the absolute want of eligible territory within the United States to meet the constant requirements of colonization, and from the intimate relation of these northern valleys to the great continental movements of the day, that we may reasonably expect a population of a million and a half within the agricultural district of Rupert's Land, within a period of twenty-five years. This conclusion is a startling one, but it is founded on positive data no less startling. It is deduced from what we ascertain to be the quantitive relation between the extent of territory within the United States eligible for agricultural settlements, and the extent of territory constantly required for that purpose.

Notwithstanding the arguments of Mr. Carey, the history of the growth of the western states of America exhibits a population constantly receding from the centers of commerce in search of the cheapest and best soils; that is to say, of soils yielding the largest returns for the labor bestowed and capital invested; and the frontier extends precisely as the disadvantage of distance from market is overcome by the ratios of returns to capital. This is the only limit to the diffusion of population on the continent.

In 1820, when lands were worth fifty dollars per acre in Massachusetts and one dollar in Ohio, the New England farmer improved his condition by emigrating to Ohio; and when, in 1840, the best lands of Ohio were worth fifty dollars

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per acre and those of Illinois one dollar and a quarter, he could again move with profit to Illinois; and again, in 1850, from lands worth fifty dollars in Illinois to the cheap lands of Minnesota or Kansas. In like manner, when the best lands are worth fifty dollars per acre in Minnesota, with improved facilities of communication, it will be advantageous to form settlements in the Saskatchewan valley.

It is the distinguishing feature of this aggressive movement of population that it appropriates only the best lands and most eligible situations, as along water courses and streams.

Law of the Territorial Expansion of Population.—For the purpose of ascertaining the ratio of the territorial expansion of population within the United States, we may assume the Alleghanies as the geographical base of the movement, the census year of 1790 as the starting point in time, and the increase of occupied areas as approximately defined by the accession of new states.

Table showing the expansion of population relative to the occupied areas.

	1790.	1800.	1810.	1820.	1830.	1840.	1850.	Average per cent.
Population of Western States,	108,868	385,737	1,078,315	2,217,464	3,672,569	6,376,972	9,793,637	
Increase of population per cent.,		256	180	106	67	71	53	112
Occupied area in sq. miles,		83,280	123,244	351,491	418,971	527,411	1,025,763	
Increase of area per cent.,			48	185	19	26	94	74

We thus see that population in the west increases faster than the areas which it occupies, maintaining the following densities for a period of fifty years.

1800,	4.6	persons to	one	square mile.
1810,	8.6	"	"	"
1820,	6.6	"	"	"
1830,	8.7	"	"	"
1840,	12.	"	"	"
1850,	9.5	"	"	"

These densities, the fluctuations of which are caused by accessions of new states, may be regarded as constituting the degree of internal pressure necessary to impel population beyond the frontier. When population is eight to a square mile it emigrates.

The comparative increase of population and area for sixty years, of states west of the Alleghanies, is as follows:

Average decennial increase of population, . . . 112 per cent.
Average decennial increase of area, ... 74 "

To state this relative expansion in another form: while the population of the states west of the Alleghanies increased in fifty years from 385,739 to 9,793,637, the number of states increased from two to fifteen, with an aggregate area expanding from 83,280 to 1,025,763 square miles.

The actual increase of area absorbed every two years by the extension of state organization is as follows:

	New States.	Increase of area in sq. miles.	Increase of Population.
1800,	2	83,280	276,869
1810,	1	39,960	692,578
1820,	5	228,347	1,149,149
1830,	1	67,381	1,545,105
1840,	2	108,441	2,704,403
1850,	3	498,322	3,416,665

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Decennial average for fifty years, ... 170,955 square miles.
" " *for thirty years,* . . . . 224,728 "

The territorial expansion of population in the United States, therefore, absorbs, every ten years, at the lowest estimate, an average area of 170,955 square miles. In fifty years more it will require, at this rate, 854,775 square miles of additional territory to supply the habitual demand for westward colonization. Now let us see where this supply is to come from.

Arable Areas of United States Exhausted.—The extended explorations made within the last few years under the auspices of the United States government, of the region between the Mississippi and the Rocky mountains, have revealed the startling fact in the physics of the United States, that the westward progress of its population has nearly *reached the extreme western limit of the areas available for settlement*, and that the whole space west of the 98th parallel, embracing one-half of the entire surface of the United States, is an arid and desolate waste, with the exception of a narrow belt of rich lands along the Pacific coast. This momentous fact, which is destined in its results to revolutionize the whole scheme of continental development, and to give a new direction to the movements of trade and population, was first announced as a positive generalization by Professor Henry of the Smithsonian Institute, in a learned paper on meteorology in its connection with agriculture. From this paper we quote: "The general character of the soil between the Mississippi river and the Atlantic, is that of great fertility. The portion also on the western side of the Mississippi, as far as the 98th meridian, including the states of Texas, Louisiana, Arkansas, Missouri, Iowa, and Minnesota, and portions of the territory of Kansas and Nebraska, are fertile, though abounding in prairies, and subject occasionally to droughts. The whole space to the west between the 98th meridian and the Rocky mountains, is a barren waste, over which the eye may roam to the extent of the visible horizon, with scarcely an object to break the monotony. From the Rocky mountains to the Pacific, with the exception of a rich, but narrow belt along the ocean, the country may also be considered in comparison with other portions of the United States, a wilderness unfitted for the uses of the husbandman; although in some of the mountain valleys, as at Salt Lake, by means of irrigation, a precarious supply of food may be obtained."

It is not necessary to quote the detailed description of this American Sahara. The concluding words of Prof. Henry, upon this subject, are more to our purpose. "We have stated that the entire region west of the 98th degree of west longitude, with the exception of a small portion of western Texas, and the narrow border along the Pacific, is a country of comparatively little value to the agriculturist, and perhaps it will astonish the reader if we direct his attention to the fact that this line, which passes southward from Lake Winnipeg to the Gulf of Mexico, will divide the whole surface of the United States into two nearly equal parts. This statement, when fully appreciated, will serve to dissipate some of the dreams which have been considered as realities, as to the destiny of the western part of the North American continent. Truth, however, transcends even the laudable feelings of pride of country, and in order properly to direct the policy of this great confederacy, it is necessary to be well acquainted with the theatre in which its future history is to be enacted."

That "rich but narrow belt of fertile lands upon the Pacific," has already been blocked out with the prosperous states of California and Oregon, with an aggregate population of 800,000.

Upon the eastern bank of the great American desert, Kansas already contains a population sufficient to form a state. Eastern Nebraska and Dakota are rapidly filling up. Here are, altogether, about 160,000 square miles to be made into new states, and this is all that remains of the national domain—all that remains to supply an imperative and permanent demand for new areas, which absorbs 170,955 square miles every ten years in the formation of new states.

In the very fullness and strength of its westward flow, the tide of immigration is even now arrested upon the brink of a sterile waste, which covers half the national domain.

Necessary Results of the Restricted Supply of New Territory.—This event is the turning point in American history. It is the beginning of that cumulative pres-

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sure of population upon the means of subsistence, which is to test the stability of our institutions. But aside from its political effects, it will have these important results on the material condition of the country.

1. It will condense population within its present limits, and thus add to the wealth and social power of existing states.

2. By placing a positive limitation upon the supply of western lands it will largely enhance their value.

3. It will concentrate the entire expansive movement of population on this continent in the direction of the fertile valleys of the Winnipeg. It is to the last of these conclusions that our present inquiries are directed.

The Region North-west of Minnesota, the sole remaining Theatre of Colonization.—Upon the northern edge of the great Sahara, which we have described, the valleys of the Red river and Saskatchewan, carrying the rich and grassy undulations of the Mississippi plain, from Minnesota to the gorges of the Rocky mountains, form an isolated belt of verdure across the western half of the continent, an isthmus of fertile and habitable lands, between the Arctic wastes which extend to the Frozen Ocean on the north, and the vast deserts between the Mississippi and the Pacific coasts, which fringe its southern border in the cretaceous plateaux of the Missouri. This green zone, whose fitness for the abode of men was, but two years ago, the patent of a company of traders, occupies to-day the conspicuous position that it remains the sole theatre of colonization, open to a people which, as we have shown, absorbs at the least, 170,955 square miles every ten years, in extending the bounds of its settlements.

This permanent ratio of territorial expansion, within the United States, supposing no political obstacles to the free influx of immigration, would, in twenty-five years from now, fill the whole basin of the Winnipeg, from the borders of Minnesota to the Rocky mountains, with a population sufficient to form eight new states of the size of Ohio, with a density of population equal to that of Minnesota or Wisconsin, when admitted into the Union, and more than sufficient to entitle them to admission into the Union, if they were in American territory.

The equivalent period of twenty-five years just past in the subjacent regions of the United States has added to the Union nine new states, with an aggregate area of 934,462 square miles, and containing a population of over three millions.

Assuming that all the forces which threw this large population into the new states of the Mississippi valley and of the Pacific still exist with unimpaired activity, the progress of settlement necessarily concentrated in this direction, would fill the whole international district of available lands from Red river to Puget's sound, an area of 500,000 square miles, in thirteen years, with a population of one and a half millions. If this rapid advance of settlement within the last quarter of a century is considered exceptional or due to temporary causes, the average frontier expansion of the United States, which is in fact a constantly increasing quantity, but which we have assumed as a fixed ratio, at a value far below the average of the last thirty years, would still colonize the district in twenty-five years.

This conclusion is deduced from the ordinary laws of frontier growth operating upon the only district available for settlement, without taking into the account the political obstacles which may arrest the legitimate tendencies of population in that direction, or the causes which may stimulate them.

In this connection we may repeat the remark already made, that the tendencies of population on this continent are governed primarily by the direction of its navigable waters, in other words by facilities of access to market. Artificial highways may ultimately deflect the lines of settlement from this original distribution, but it was upon the immediate trough of the Connecticut, the Hudson, the St. Lawrence, the lakes, the Ohio, the Mississippi and its tributaries successively occupied, that the foundations of states were laid.

The great extent of its navigable water line will, therefore, form an important element in the development of this new north-west. Its navigable waters, extending to the foot of the Rocky mountains, are the natural projection across the continent of the lines of overland transit converging upon its basin in the waters of the St. Lawrence, the Mississippi and the Missouri. It is the only

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direction upon the continent in which navigable rivers go beyond the ninety-eighth meridian.

Thus the hydrographical character of the country as well as the nature of the soil, imperatively determines the course of settlement to these northern valleys. But with the definite direction given to the movement of population by these physical circumstances, there are causes of an extraordinary nature actively concurring to press forward the work of colonization to these new districts.

Prominent among these, the rich discoveries of gold upon Fraser river have given a new importance to the British possessions in Western America, and the colony of British Columbia was established in 1858 under auspices scarcely less dazzling than those which marked the birth of the American El Dorado. While this event roused the latent interest of the public in the question of a northern railway communication with the Pacific, the developments growing out of the Canadian controversy with the Hudson Bay Company had the effect of directing public attention to the extraordinary advantages for the construction of such a railway which is presented by the level belt of British valleys which bridges the vast deserts of Western America with an uninterrupted girdle of fertile lands extending from the terminus of inland navigation at the heart of the continent, across the passes which nature has opened in the Rocky mountains to the shores of the Pacific.

The same physical reasons which are determining the tendencies of population on this continent are also deciding for us the location of this great inter-oceanic highway. It is as the natural route of a railroad, whose completion would make Minnesota the distributing center of the world's commerce, that these northern valleys lie at the foundation of our commercial development. Its capacity to sustain population, its commercial resources, its colonization, are chiefly important as auxiliary to the grand scheme of a Pacific railroad which will carry the concentrated commerce of two oceans.

The development of these districts has already commenced. The immigration to Fraser river in 1858 led to the establishment of the new colony of British Columbia, on the Pacific coast, while the settlement on Red river forms the nucleus of another prosperous British province. Hundreds of emigrants have already sought this route to the gold fields of the Rocky mountains.

The opening of steam navigation on Red river connects the new districts with the central movements of American enterprise. The curtain has thus been lifted upon the grand drama of colonization, to be re-enacted in a new and magnificent theater.

32. Northern Pacific Railway.

The Commercial Zone.—The question of a highway across the American continent, for the interoceanic commerce of the globe, divides the commercial and industrial world into the two grand parties of the *North* and the *South*, following in these divisions the general climatic distribution of races, of temperaments, of plants, of governments, of labor and of productions. Commander Maury,* in proposing two railways to the Pacific, as a physical necessity resulting from this segregation of northern and southern interests and from the coincident channels of traffic marked out by the course of the ocean and atmospheric currents, in order to a more distinct climatological definition of these interests, lays out the northern temperate zone into two grand, characteristic thermal bands, in which are concentrated the mass of mankind.

The United States lie generally within the isotherms of thirty-five and seventy degrees. To describe these lines geographically, with the free tracing of Maury, the isotherm of thirty-five degrees will pass through Sitka, in Russian America, the mouth of the Red river, the north shore of Lake Superior, and Quebec, and through Christiana, Kiachta, and the mouth of the Amoor. The mean temperature of all places south of this line is more than 35°. The isotherm of seventy degrees, starting from San Diego, in the gulf of California, crosses

*Letter to Col. D. A. Robertson, of St. Paul.

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the Colorado at its mouth, runs through Austin, Texas, and by New Orleans and Pensacola to the sea. Striking the African coast near Mogadore it goes through Cairo, Ispahan and Delhi to Canton. The mean temperature of all places north of this line is *less* than 70°. The belt thus described is divided into two nearly equal bands by the isotherm of 52°, which, commencing at cape Orford, on the Pacific, goes by a tortuous course to Santa Fe and through St. Louis, Baltimore, London, Brussels, Zurich, Varna and Pekin. Maury calls these "the Upper and Lower bands." The fauna and flora of these bands differ; the climate, the people and their pursuits differ. In the lower band the chief commercial plants are the orange, vine, fig, peach, pomegranate, citron, melon, St. John's bread, sweet potatoes, rice, indigo, tobacco, hemp, cotton, tea, sugar and naval stores. In the upper band the cereals, buckwheat, hay, Irish potatoes, turnips, apples, pears, plums, flocks and herds. Nearly all the active wealth, the commercial power, the seats of manufactures, the great marts of commerce, lie within this band. London, Manchester, Paris, Lyons, Brussels, Moscow, Irkoutsk, Pekin, New York, Boston, Montreal, Cincinnati, Chicago, and the satellites of these great centers, array all the motive forces of the old and new worlds within this industrial zone. The transmundane movements of commerce between these great marts, which now pursue the circuitous indirection of the ocean routes around the shores of the continents, are constantly seeking to emancipate themselves from these physical restrictions by means of railways and telegraphs. Most of the railways, therefore, of Europe and America lie within this band. Russia is rapidly developing a system of improved communication along this line to the eastern extremities of Asia. American enterprise has carried a serried girdle of railroads along the same zone half-way across the continent to the Mississippi river, and the central railway movement of the world, backed by all the commercial forces of the age, is thus steadily and inflexibly going forward upon the path of the *northern Pacific railway.*

Projected Northern Routes.—In any scheme of a northern railway to the Pacific, the navigable limit of the Mississippi or Lake Superior, in Minnesota, is its assumed, as it is its necessary base. There are two practicable routes for a northern railway. (1.) The national route surveyed for this purpose by Governor Stevens, for the general government, begins at St. Paul, and, trending to the northwest, crosses the head of navigation on the Red river to the northern bank of the great bend of the Missouri, near the head of navigation on that stream, and keeping generally between the parallels of 47° and 49°, terminates on the waters of Puget's sound. Of this route the main trunk of the Minnesota and Pacific line of the Minnesota system of land grant roads is designed as the radix. From the political necessity of keeping within the United States this line, though superior in all respects to its southern competitors, encounters some disadvantages which are entirely obviated by a more northerly route, indicated by the whole structure of the continent as the natural pathway of commerce between its east and west coasts.

(2.) This is the great international route, lying through the level and fertile valleys of the Winnipeg and reaching the Pacific through Palliser's pass. Though never officially surveyed with a special reference to railroad construction, its topographical adaptation thereto is well ascertained by the explorations of British surveyors. Of this route, the branch of the Minnesota and Pacific railroad from St. Anthony to Pembina, on the international boundary, on which construction has been recently suspended, is designed as the nucleus.

Climatic objections disposed of.—Both these routes belong to the upper thermal band, described by Maury as having the climatic conditions most favorable to railway development. "St. Paul," he says, "is the center of the upper band, and there is a railroad already under way from St. Paul to Pembina. A branch from this road, leading to the Pacific, will most fairly represent the system on the upper band." The ignorant objections heretofore urged to this route, on the score of climate, are forever set at rest by the ascertained facts of temperature, and which are succinctly enough defined by Maury's thermal bands.* Blodgett's rain maps dispose even more emphatically of the still more grossly

* Vide Statistics of Climate.

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groundless notion that snow storms and drifts in winter would prove an obstacle. The demonstrated facts are that from St. Paul to the Rocky mountains the total fall of snow during the winter averages but *twenty inches.* In Canada, where snow is no obstacle to railroads, *it is fifty inches.* In the New England states it is from seventy inches in the interior to one hundred inches on the seaboard. The snows along the plains of the northern route are only *one-fifth* of what they are in the railroad state of Massachusetts. In the Rocky mountains the snow-fall is one-half that of Massachusetts. The climate is more humid on the Pacific coast, but it is as mild as that of England, and moisture falls usually in the form of rain.

Tabular Comparison of Surveyed Routes.—The following tables give a condensed summary of the comparative statistics of the different routes surveyed by the general government from the reports of the Secretary of War, corrected by Gov. Stevens in an address delivered in 1859, before the American Geographical and Statistical Society.

Table showing the length, sums of ascents and descents, and equated distances (or length of level route of equal working expense) of the several routes explored for a railroad from the Mississippi to the Pacific.

Description of Route.	Distance by proposed railroad line.	Sum of ascents and descents.	Length of level route of equal working expense.	Through lands generally sterile.
	Miles.	Feet.	Miles.	Miles.
a. Route near 47th and 49th parallels, Superior City to Seattle,	1,750	21,787	2,164	320
b. Route near 47th and 49th parallels, Superior City to Vancouver,	1,733	17,587	2,067	320
1. Route near 47th and 49th parallels, St. Paul's to Seattle,	1,764	21,787	2,178	320
2. Route near 47th and 49th parallels, St. Paul's to Vancouver,	1,747	17,587	2,081	320
3. Route near 41st and 42d parallels, from Rock Island, via Council Bluffs, via South Pass, to Benicia,*	2,299	29,387	2,853	1,400
4. Route near 35th parallel, from Memphis, via Fort Smith, to San Francisco,	2,366	48,791	3,285	1,450
5. Route near 35th parallel, from Memphis, via Fort Smith, to San Pedro,	2,090	49,132	3,015	1,400
6. Route near 32d parallel, from Gaines, via Fulton, to San Francisco, by coast route,	2,174	38,350	2,897	1,190
7. Route near 32d parallel, from Gaines, via Fulton, to San Pedro,	1,748	30,331	2,319	1,190
8. Route near 32d parallel, from Gaines, via Fulton, to San Diego,	1,683	33,604	2,317	1,159

* The distance from Benecia to St. Louis is 2,462 miles.

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Miles of route elevated above the sea.

Route.	Less than 1,000 feet.	Between 1 and 2,000.	Between 2 and 3,000.	Between 3 and 4,000.	Between 4 and 5,000.	Between 5 and 6,000.	Between 6 and 9,000.	Altitude of highest point.
1	353	433	733	180	62	6		6,044
2	463	391	648	178	61	6		6,044
3	487	170	210	160	590	285	397	8,373
4	855	290	261	236	181	295	248	7,550
6	1,043	347	120	342	271	50		5,717

Route five corresponds in elevations with route four, and routes seven and eight with route six.

Lineal distances by shortest railroad routes, from Seattle, via St. Paul, and from Benicia, via South Pass, Council Bluffs and St. Louis, to the several ports of the Atlantic and Gulf coasts.

	From Seattle, via St. Paul.	From Benicia, via St. Louis.	Difference in favor of northern route.
To Portland,	3,249	3,831	582
" Boston,	3,352	3,696	344
" New York,	3,126	3,546	420
" Philadelphia,	2,988	3,454	466
" Baltimore.	2,966	3,355	389
" Washington,	3,004	3,375	371
" Charleston,	3,328	3,445	117
" Savannah,	3,313	3,430	117
" Mobile,	3,030	3,147	117
" New Orleans,	3,115	3,232	117
Averages,	3,131.1	3,453.1	

Distances.—Thus the average distances from Seattle, via St. Paul, to the principal ports of the Atlantic and Gulf, is 316 miles less than from Benicia, via St. Louis, to the same points. Thus every seat of commerce on the coast is nearer to Puget's Sound by the northern route than to San Francisco by the Central. For details of railroad distances to St. Paul, see Appendix.

Gradients.—The great superiority of the northern route in natural gradients, is manifest from the table. This superiority would be largely increased by following the level plains of the Saskatchewan to the more favorable passes north of the parallel of 49°.

Capacity for Settlement.—It will be observed that all the southern routes pass over a wide belt of sterile lands, from 1,159 to 1,450 miles in breadth, while all the uncultivable lands on the northern route amount to but 320 miles, lying in scattered tracts along the route. The southern routes pass through the middle of the Great American Desert, while the northern passes over its extreme upper edge. This difficulty may be *entirely obviated* by the deflection of the northern route, two or three degrees farther north to the trend of the Saskatchewan valley. This is the only route capable of continuous and profitable settlement along its whole line, and is the only one, therefore, which possesses the necessary elements of sustentation in way traffic independent of through commerce.

Natural Water Lines.—Regarded in its whole length across the continent, as a channel of transit from seaboard to seaboard, the grand and striking characteristic of the northern route, is its magnificent extent of collateral water line, occupying nearly three-fourths of the entire distance across the continent, directly upon the path of the northern railway. The southern routes are entirely destitute of navigable waters west of the Mississippi. The St. Lawrence and the Great Lakes form a vast interior sea, navigable for ocean

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ships for 1,655 miles, half-way across the continent to the head of Lake Superior. 250 miles of railroad will connect this point with the Red river, where the confluent waters of Lake Winnipeg take up the navigable chain and carry it on the south branch of the Saskatchewan for 1,700 miles farther west to the Chesterfield House. Crossing the mountain chain by the Kootanais pass, a distance of 850 miles of land travel completes the journey to the Pacific. Leaving out the waters of the Pacific slope entirely, we have here an aggregate of 3,400 miles of navigable water line upon the direct route of the international Pacific railway, leaving still 1,100 miles of intermediate distances to be overcome by railroad transit. In Chapter VI, a comparison is made of the cost transit by rail and water respectively. The rule is elicited that the through distances of water transit by lake, canal, and river, cost a maximum average of of 4 6-10ths mills per ton per mile, while the average rates by rail are and 24 1-2 mills per ton per mile. The water rates are increased on rivers in proportion to difficulties of transit. For the sake of illustrating the important bearing of this system of aqueducts across the continent upon the direction of traffic, we will assume these rates for the water lines of the east half of the continent, and charge 10 mills, or more than double, for the water lines on the west half, leaving the railroad rates the same throughout, and we have the following results:

Northern Water and Rail Route.

	Miles.	Cost per ton.
Water to head of Lake Superior,	1,655	$7.61
Railroad to Red river,	250	6.12
Water to Chesterfield House,	1,700	17.00
Railroad to Puget's sound,	850	20,91
Central Rail Route.		$51.64
From New York via St. Louis by shortest rail route to Benicia,	Miles. 3,546	$87.23
Difference in favor of northern water line, per ton,		$35.59

Now, when a difference of a few cents per ton per mile will often turn the whole stream of traffic from the dearer to the cheaper channel, it will at once be seen that in the great flow of transmundane trade involving the transportation of vast amounts of heavy goods from ocean to ocean, a difference so great as that shown in the above comparison must inevitably fix the northern water lines as the future channel of that commerce.

The theory of a Pacific railway by the more southern routes is, that the heavy freights will continue to be carried by the ocean routes around the continent, while the lighter freights and passenger traffic will be carried by rail across it. The northern Pacific railway, in connecting the links of this immense chain of inland navigation, will supersede the ocean route and establish itself as the chief, if not the only channel of interoceanic transportation.

Its Pacific Terminus.—Moreover, the Pacific terminus of the northern route rests upon a group of the finest harbors in the world, in a mild climate, and supplied with all the essentials of a first class naval station in the adjacent coal mines and forests of Vancouver's Island. Its position with respect to Asiatic ports is such as to give it the command of the ocean trade. The following table, prepared by Gov. Stevens, gives the sailing distances from the principal ports in Asia to those of our western coast.

	To Seattle. Miles.	To Vancouver. Miles.	To San Francisco. Miles.	To San Diego. Miles.
From Amoor,	3,850	3,895	4,110	4,520
From Shanghae,	5,140	5,215	5,430	5,830
From Canton,	5,900	5,975	6,140	6,550
From Calcutta,	8,730	8,805	8,970	9,380
From Melbourne,	7,280	7,205	6,930	6,990
From Sandwich Islands,	2,380	2,305	2,050	2,190

Space will not permit a more extended discussion of this subject at present.

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Commercial Destiny of Minnesota.—Assuming the development of the immense extent of fertile country tributary to Minnesota in British America, with its commercial radius extended by steam navigation through the rivers which flow over her borders, to the Rocky mountains, we have seen this young state advancing, by the resistless pressure of physical and social laws, to the first position among the inland states of the continent, commanding without a rival, a commerce equal to all the commerce of the present states of the northwest. Given one step more in this development, a railroad to the Pacific, based upon the termini of inland navigation on Lake Superior and the Mississippi, an event close at hand among the reasonable probabilities of the future, and Minnesota, the entrepot of all the transmundane commerce which will flow through that narrow channel to break bulk upon her water lines, must occupy a position without a parallel in any inland state in the world. The imports of England alone, from the seas of the Pacific, amounted in 1843 to $97,486,200. A recent estimate places the whole imports of the Atlantic states of both continents, from the Pacific side at $200,000,000. The exports in return would swell the aggregate exchanges to $400,000,000. To make Minnesota the toll-gate of this vast trade, the focus of distribution through all her radiating lines of railroad and navigation, to the east and west and south and north, for the incalculable commerce which a Pacific railway would pour into her lap; to enthrone her at the great "Parting of the Waters," as the central market of exchange for the confluent treasures of Europe and Asia and America—such is the sublime destiny which developes itself for the future of this young state, as the crowning consequence and logical consummation of existing facts and tendencies in the physical and commercial world.

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CHAPTER II.

PHYSICAL GEOGRAPHY OF MINNESOTA.

1. Astronomical Position.

	Latitude.	Longitude.
North-eastern extremity of State,	48°	89° 29′
North-western " "	49°	97° 5′
South-western " "	43° 30′	96° 26′
South-eastern " "	43° 30′	91° 12′

2. Boundaries.

(1.) *Political Boundaries.* Minnesota is bounded by political divisions as follows:

By the British Possessions on the north; by Dakotah Territory on the west; by Iowa on the south, and by Wisconsin on the east.

(2.) *Legal Boundaries.* For the boundaries established by act of Congress, see act authorizing a state government, "Document A," of Appendix.

(3.) *Natural Boundaries. On the East, running Northward.* The Mississippi river, 133½ miles; the St. Croix river, 129½ miles; imaginary line due north to first rapids of St. Louis river, 41 miles; St. Louis river and bay, 23 miles; Lake Superior, 160 miles. Total length of eastern boundary, 487 miles.

On the North, running Westward. Pigeon river and chain of lakes to Rainy lake, 220 miles; Rainy lake and river, 120 miles; Lake of the Woods, 35 miles; Parallel of 49°, 100 miles. Total length of northern boundary, 475 miles.

On the West, running Southward. The Red River, 380 miles; Sioux Wood river, 40 miles; Lac Traverse, 15 miles; Portage, 3 miles; Bigstone Lake, 26 miles; imaginary line, 124 miles. Total length of western boundary, 588 miles.

On the South. Parallel of 43° 30′, 262 miles.

The total length of the boundary lines of the state is 1,812 miles.
The elements of this aggregate may be thus classified:

Formed by navigable waters,	904 miles.
" by imaginary lines on land,	530
" by unnavigable streams and lakes not connected with navigable waters,	378
Total,	1,812

For a thorough analysis of the topographical composition of the boundaries of Minnesota, see Table 1.

3. Dimensions.

	Miles.
Length of the eastern boundary,	487
" " northern "	475
" " western "	588
" " southern "	262
Total,	1,812

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	Miles.
Greatest length of a north and south line,	380
Air line breadth on northern boundary,	358
Breadth from Pigeon Point on a due west line,	337
Breadth on southern boundary,	262
Breadth at the narrowest portion of the state, between Lake St. Croix and the state line,	183

4. Area.

The area of the state, that portion which is unsurveyed being computed from the exterior lines, is 81,259 square miles, or 52,005,760 acres.

See Table II. for the areas of counties.

5. Contour and Distribution of Surface.

1. *Surface Contour.* Within the circular chain of drift knolls, known as the Hauteurs des Terres in northern Minnesota, interlap at nearly the same elevation, the sources of the three great river systems of the continent. The slopes of the adjacent valleys, converging upon this central ridge, give to the surface of Minnesota with the general aspect of an undulating plain, the contour of a pyramidal roof, down whose opposite sides the disparted waters descend to their ocean outlets. Two-thirds of this surface slopes southeastwardly with the waters of the Mississippi; the rest is divided between the adjacent levels of the Red river on the northwest, and the broken highlands of the northeast, which are drained by the precipitous streams of Lake Superior.

The summit of the state is at the pinnacle of the narrow dividing ridge of drift hills in latitude 47° 7′ and longitude 95°, upon which culminate the utmost sources of the Mississippi and Red river.

This point is 1,680 feet above the Gulf of Mexico, and 2,896 miles from it by the river's course.* Lake Itasca, claimed by Schoolcraft as the source of the Mississippi, is 1,575 feet above the sea.

From this point south-eastwardly, in a distance of 630 miles by its course to the mouth of the Minnesota, the river falls 936 feet, while the general level of the country sinks in the same direction 830 feet. From the plateau of Fort Snelling, which is 850 feet above the sea, the banks of the Mississippi gradually rise to an average height near the Iowa line of 1,000 feet above the sea, while the river, sinking gently at the rate of four inches to the mile, gives that progressive and picturesque elevation to the banks which characterizes the descent of the Upper Mississippi.

Towards the Minnesota valley the surface of Minnesota exhibits an exterior depression, which is continued through the Red river valley and the great transverse basin of the Saskatchewan, and exercises an important influence on the climate. Big Stone Lake, an expansion of the Minnesota river upon the western boundary of Minnesota, is 734 feet below the Itasca summit and 1,080 feet below the dividing ridge of the Coteau des Prairies, where the Minnesota takes its rise. In a distance by water of 334 miles from this point to its mouth at Fort Snelling, the Minnesota falls only 222 feet.

The Red river valley, whose southern pole culminates in Lac Traverse, separated from Big Stone Lake by a ridge scarcely three miles in width, lies upon the same plane of elevation as its neighbor. The Red river valley has no perceptible slope towards its outlet, and maintains an uniform altitude throughout its whole length, of nearly 1,000 feet, which is the average elevation of Minnesota south of the watershed. Lake Winnipeg is 853 feet above the sea. Lac Traverse is 966, a descent in the length of the stream of but 113 feet in a distance of 519 miles by its course, or two and three-fifths inches per mile. The river originates at right angles to the main axis of its valley, close upon the Mississippi summit, at a height of 680 feet above the general level of its basin.

The Hilly District. The Hauteurs des Terres.—A remarkable exception to this general character of undulating plain exists in the rugged ranges of drift and

* This is Nicollet's estimate, measured upon Colton's map by A. J. Hill, from Minnesota downwards, and taking the best authenticated measurements above that, the distance is but 2,527½ miles.

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primary outbreak which enclose the basin of Lake Superior in north-eastern Minnesota. These trappean and granitic ranges with their overlying stratum of drift, whose extreme western elbow gives origin to the Mississippi, and which constitute the "Height of Land" or *Hauteurs des Terres*, between the waters which flow into Hudson's Bay, the Atlantic, and the Gulf of Mexico, respectively, afford the nearest approach to mountainous elevations in the state.

These elevations are commonly flat at top, varying in height from 85 to 100 feet above the level of surrounding waters. The principal group of these drift hills is subdivided into several ramifications, ranging in extent, elevation, and course, so as to determine the hydrographical basins of all the innumerable lakes and rivers which so peculiarly characterize this region of country.

A prominent spur of these hills extends in a southerly direction, from the Itasca Crest to latitude 46° from what is called the "Loaf Mountain" range, the "Coteau du Grand Bois" of Nicollet. This is the dividing ridge between the Mississippi and Red river waters, and has a general elevation of 1,500 feet above the sea.

Trap Hills.—The highest of the trap-summits, north of Superior, rise only to the height of 1,475 feet above the sea, 205 feet below the Itasca summit. The dividing ridge between east and west Savannah rivers, belonging respectively to the Superior and Mississippi basin, is 1,334 feet above the sea.

Lake Superior is stated by Nicollet to have an elevation of 626 feet, while Richardson's measurement is 641 feet above the sea. The general elevation of the northern brim of the Superior basin is stated by the same authority at 800 or 900 feet above the surface of the water, and the distance of its crest from the margin of the lake is from 20 to 50 miles. For the purpose of distinction, therefore, we may call this the Mountain District.

6. Statistics of Contour.

The surface of the submontane district slopes generally towards the Mississippi and Red rivers, the center of depression for the whole state being at the confluence of the Minnesota and Mississippi rivers.

The following table of elevations along the principal axes of depression will indicate the general contour of the country.

Table of Elevations, from J. J. Nicollet.

Course of Mississippi.

	Highest point, feet.
1. Utmost sources of the Mississippi at the summit of the Height of Land,	1,680
2. Itasca Lake,	1.575
3. Crow Wing river at mouth,	1,130
4. Falls of St. Anthony, Minneapolis plateau,	856
5. Fort Snelling plateau,	850
6. Mouth of Minnesota, lowest point,	744

Course of Minnesota.

1. Sources of St. Peter, in Dakota,	1,896
2. Middle of Big Stone Lake on western boundary of the State,	966
3. Lacqui parle,	946
4. Mouth of Cottonwood,	811
5. Minnesota at Traverse des Sioux,	793
6. Mouth of Minnesota,	744
7. Top of Pilot Knob, opposite mouth,	1,006

Elevations on road from Mendota to Spirit Lake, by Nicollet.

	Height above the sea, feet.
Hills in Big Woods, bordering Cannon river,	1,238
Izuzah lake,	1,186
Sakatah lake near head of Cannon river,	932
Surrounding hills,	1,075
Crossing place on Blue Earth river, near Blue Earth city,	1,114
Prairie land on both sides,	1,179
Spirit lake, north shore,	1,310

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Course of the St. Croix, by Dr. J. G. Norwood.

	Height above the level of the Mississippi at St. Paul, feet.
St. Croix and Brule Portage, Wis.,	656
Nine miles above mouth of Kettle river,	304
Trap-dike, nine miles above St. Croix Falls,	466
Stillwater, one mile north on table land,	250
Table land at mouth of St. Croix,	105
Mouth of St. Croix, feet below given point,	7

Course of Mississippi below mouth Minnesota, by Nicollet.

	Height above sea. Water level.	Land level.
St. Croix river, mouth,	729	
Table land at mouth of St. Croix,		866
Summit of bluff at Red Wing,		1,036
Water level at same point,	714	
Top of Eagle Bluff, near La Crescent,		1,214
Water level near La Crescent,	683	

7. General Description of Surface Forms.

With these general and insensible depressions, indicated by these figures, the face of the country presents everywhere the aspect of an undulating plain like the adjoining states of the north-west, but with a more picturesque variety of detail than they. The rivers of Minnesota, cutting deep troughs in the table land, and mingling the bold and angular outline of their bluffs with the rounded and graceful sweep of their valleys, afford some of the most animated scenery on the continent, while the innumerable lakes scattered over its surface, the number and beauty of its groves and belts of timber, which crown the undulations of the upland, or shadow the margins of streams, break up the monotony of the prairie into forms of infinite variety and beauty, and unite all the elements, not only of successful husbandry, but of delightful landscape, in the limits of almost every farm.

The section of Minnesota lying west of the Mississippi, including the valley of the Red river, and comprising two-thirds of the area of the State, is a continuation of the surface forms of Iowa and Southern Wisconsin, presenting a succession of rolling prairies and table lands, resting on sedimentary rocks, largely overlaid with diluvial deposits, covered throughout its whole extent with a thick calcareous mould, and traversed by numerous streams with wooded margins, and dotted with occasional lakes, groves, and some wide belts of timber. The triangular district lying east of the Mississippi is an extension of the more diversified topography and complex geology of central and northern Wisconsin, embracing with a wide belt of agricultural lands on the Mississippi, extensive forests of pine in the northern affluents of the Mississippi, and beyond these to the west and north-west of Lake Superior, a series of elevated and broken chains of hills, corresponding to the similar dividing ridge in Wisconsin between the waters of the Mississippi and Superior.

8. Hydrographical Outline.

The Mississippi River.—The Mississippi river, rising in the hills amid Lake Itasca, in latitude 47° 13′ 35,″ flows south-easterly through Minnesota, for 797 miles,* of which 134 miles washes its eastern boundary. It has three grand divisions:

(1.) From its source to the foot of Pokegoma Falls, (the extreme limit of high water navigation for steamboats,) where in its labyrinthine course through the lakes and down the ridges of the watershed, in a distance of 263 miles, it has

* The distances given in this chapter are derived from the "Tables of river distances," published in the appendix. These were prepared with great labor and care by Mr A. J. Hill, of St. Paul, and are taken from the surveyed measurements or deduced from a laborious comparison of all the scientific authorities who have given estimates. Nicollet's distances are all much too great. For example, the length of the Mississippi in Minnesota, in his tables, amounts to 912 miles, 115 miles too much.

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a descent of 340 feet, or over 15 inches per mile. [See No. 2 of Tabular Series IV.]

(2.) From Pokegoma Falls to the head of steamboat navigation below St. Anthony Falls, where, in a distance of 361 miles, it falls 590 feet, or over 19 inches per mile, but widened and deepened by numerous tributaries and interrupted only twice by innavigable rapids, the intervals presenting long reaches of slack water navigation. [See No. 2 of Tabular Series IV.]

(3.) From the foot of the rapids below St. Anthony Falls to the Iowa line, a distance of 173 miles, in which the river has a fall of 5 inches per mile. [See No. 1 of Tabular Series IV.]

The Minnesota River.—The Minnesota takes its rise in the Coteau des Prairies in Dakota, in lat. 45° 47′ 58″, and extending into Big Stone Lake, on our western boundary, flows with an immense detour through one and a half degrees of latitude to the south, through the heart of Minnesota, and empties 470 miles* from its source into the Mississippi, five miles above St. Paul.

From Big Stone Lake to its mouth, a distance of 334 miles, it has a fall of nearly eight inches per mile. Thirty-seven miles above its mouth, at Little Rapids, a narrow ledge of sandstone obstructs navigation at the lowest stages of water. In good stages, boats of a small size run freely to the mouth of the Yellow Medicine, a distance of 238 miles above its mouth. Beyond this, at a slight expense, it might be made navigable to Big Stone lake, where a portage of about three miles in width separates it from the equally available waters of the Sioux wood, which falls into the Red river.

Along its navigable course it sustains an average width of 180 feet, expanding below Shakopee to 320 feet at its mouth. [See No. 3 of Tabular Series IV.]

The Red River.—The Red river rises in Elbow lake, its extreme sources however being in the Height of Land, close to the sources of the Mississippi, whence it flows southwardly through Rush, Otter Tail, and a chain of small lakes, and breaking through a low range of hills known as the Leaf mountains, runs from near the mouth of Pelican river westwardly to its confluence. From this point, the head of navigation on the Red river, it flows with replenished volume upon our western boundary, nearly due north to Lake Winnipeg, where it interlocks with navigable reaches that stretch westward to the Rocky mountains. From the mouth of the Sioux wood to the British boundaries, the Red river has a length of 879 miles; to its mouth in Lake Winnipeg, 519½ miles. It has a depth along its navigable course of from four to fifteen feet, and a width of from one hundred to four hundred feet. [See No. 4 of Tabular Series IV.]

The St. Croix River.—The St. Croix and its lake expansion, rises in Wisconsin, but its principal tributaries, the Kettle and Snake, belong to Minnesota. This river forms 129½ miles of the eastern boundary of the state, from the outlet of St. Croix lake to a point near the mouth of Spruce river. Fifty-two and a quarter miles of this distance from the outlet, to Taylor's falls, is navigable for steamboats. The river is less important for its navigation, than for the pineries which clothe its banks, and for the unrivaled water power and lumber manufactories of which it is the seat. [See No. 5 of Tabular Series IV.]

Lake Superior.—Lake Superior washes 167 miles of the north-eastern border of the state, from the mouth of St. Louis river to Pigeon point. [See table.] It has the following dimensions and area: *Length*, 420 miles. *Breadth*, 120 miles. *Depth*, 600 feet. *Elevation*, 600 feet above the sea. *Area*, 32,100 square miles.

The St. Louis river falling into Lake Superior, at its extreme west end adds 21 miles to the navigable waters of Superior, from the entrance of St. Louis bay to the foot of the first rapids above Fond du Lac. The St. Louis river is important as the first link in the great chain of rivers and lakes of the St. Lawrence system, and as connecting that system in the highlands of northern Minnesota, with the waters that flow into Hudson's bay on the north, and the Gulf of Mexico on the south. The west Savannah river, an old canoe route connect-

* Nicollet's estimate.

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ing with the waters of the Mississippi, is its most important tributary. [See Nos. 6 and 7 of Tabular Series IV.]

9. Hydrographical Subdivisions.

The areas of the great hydrographical subdivisions of Minnesota, are estimated from the maps as follows:—

	Square Miles.
Mississippi slope,	49,000
Red river slope,	17,000
Superior slope,	15,000

Subordinate Slopes.—These grand divisions suggest obvious groupings of local features.

(1.) *The Lower Mississippi Valley*, (below the mouth of the Minnesota,) embracing the subordinate valleys of the Root river, the Minneiska, the Zumbro, the Cannon and the Vermillion, which drain the eastern range of southern counties.

The progressive elevation of the bluff ranges from 850 feet above tidewater at Fort Snelling, to 1,200 on the Iowa line, indicates the general slope of the country towards the Minnesota valley.

Below Lake Pepin, where these bluffs rise three and four hundred feet above the river, the calcareous exposures at their summits, broken by intervening ravines into grim, grey peaks and craggy mural turrets, crowned with trees, and rounded at their sides into fantastic shapes, with every variety of picturesque combination and grand and graceful outline, make a scenery the most magnificent and imposing in the world.

The terraces which skirt the base of these hills, or the declivities of the hills themselves, sloping gently to the water's edge, afford convenient sites for thriving towns.

The lateral valleys share in the features of this gradual elevation. The Vermillion and Cannon rivers flow through smooth, wide prairies almost to their very mouths. The course of the Zumbro, Minneiska and Root rivers, are marked as they approach their outlets by deep sinuous ravines, cut through the series of sedimentary rocks, whose castellated summits towering above the intervening valleys seem like huge Titans guarding the sleeping beauty beneath. The soil of the valley bottoms is alluvial, very deep, and astonishingly fertile. Upon the slopes, ridges and prairies, where it is derived from the magnesian limestone which it overlays, it is scarcely less so. Lakes are rare in this district. Timber is plentifully distributed along the valleys and ravines, but is sparse on the uplands and wide prairies of the summit level. The Root valley embraces large tracts of timber, and the Cannon skirts the Big woods. The Root is navigable for small boats to Rushford, twenty-four miles. All the streams run over pebbly bottoms, and in their rapid descent break into numerous waterfalls, while their pure waters, replenished by innumerable springs, are stocked with fine trout.

This division has an area of 5,700 miles and embraces twelve counties, with a nearly uniform distribution of drainage, to wit:

Houston and Fillmore, drained by the Root river;
Monroe, by the Cedar and other Iowa rivers;
Freeborn, by the Shellrock;
Wiona and Olmsted, by the Minnesota, the Zumbro and Root;
Wabashaw and Dodge by the Zumbro;
Goodhue, by the Zumbro and Cannon;
Rice, and a part of Le Suer, by the Cannon;
Dakota, by the Vermillion.

(2.) *The Minnesota Valley.*—This district embraces a narrow band of central Minnesota, and all its south-western quarter, except the extreme south-western corner which is unwatered by the Des Moines and Big Sioux. The interior valley of the Minnesota has an average width of one and-a-half and two miles along its course, formed by a succession of level terraces and low and alluvial bottoms, alternating with the crooked windings of the river. The bottoms are either natural meadows covered with a thick grass, or are covered with a dense growth of

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timber. Of the terraces not subject to overflow, the most remarkable for beauty and convenience have been selected as the sites of flourishing towns.

The country drained by the tributary streams has a general level of 150 feet above the river. These streams generally head in lakes on the divides.

Blue Earth Valley.—The most important of these streams is the Blue Earth, which, with its affluents, spreading out like a fan from the Great Bend, drains an area of 3,300 miles, two-sevenths of the whole valley, and contributes nearly one-half of the whole volume of the Minnesota. The Blue Earth is generally from eighty to one hundred and twenty feet wide, deep, with a moderate current, walled up by banks from sixty to eighty feet high, in which the blue clay occurs which gives its name to the river, and its tint to the Minnesota, and of which Le Sueur, 160 years ago, sent specimens to France to be analyzed for copper. The average width is scarcely a quarter of a mile. All the uplands and valleys of this stream are covered with a deep, fat soil, clothed with timber, and interspersed with a multitude of beautiful wood-fringed lakes and prairies, presenting scenes of sylvan beauty, whose associations suggested to Nicollet the charming name of *Undine*, from the well known German legend. The whole country east of this valley is characterized by the profuse intermingling of rich woodland and fertile prairies. The Big Woods, twelve to fifteen miles wide, stretching south-eastward to the head of the Cannon, is edged with beautiful bays of prairie, while the interior is studded with lakes. The Blue Earth valley embraces the counties of Faribault, Martin, Waseca, Blue Earth, and parts of Brown and Cottonwood.

South-eastern slope.—The south-eastern side of the river is occupied principally by the counties of Le Sueur and Scott, across which the Big woods stretches in a broad band, skirted by fertile prairies. It takes in, also, corners of Dakota and Rice counties, to which it gives some beautiful lakes and groves.

South-western table lands.—The Cottonwood, the Red Wood, the Yellow Medicine and Lac qui parle, draining the table lands of the south-west, are the principal remaining streams of the western slope. This district is poorly wooded, but the streams and lakes are lined with timber. Except a corner of Brown it embraces no organized county divisions.

Eastern and northern slope.—On this side of the river the streams are small, with low wood-fringed banks, heading in lakes on the interior divides, where they interlap with the tributaries of the Upper Mississippi. Chains of wood-margined lakes are scattered over the whole country, with long reaches of intervening prairie intersected by occasional sloughs. It embraces the southern parts of Hennepin and Carver, distinguished for their forests, lakes and small prairies, and the fine counties of Sibley and Nicollet, and a broad belt of unorganized prairie country on its eastern bank, well watered by lakes and small streams, but sparsely timbered.

The Minnesota valley embraces the following counties and parts of counties, the fractions being italicized: *Dakota*, *Hennepin*, Scott, *Carver*, Sibley, Nicollet, *Le Sueur*, Blue Earth, Waseca, Faribault, Martin, *Cottonwood*, Brown, *Kandiyohi*, Renville and Pierce, and *Douglas*, with an area of 15,000 square miles.

8. *Upper Mississippi Valley, from the mouth of Minnesota to Crow Wing river.*—With the calcareous formation of the lower Mississippi, ends, at St. Anthony Falls, the picturesque escarpments, which give such bold and graceful outline to the scenery below. Above the falls the river sinks but little below the level of the surrounding country.

The left bank presents a continuous level of from ten to twenty feet, with a succession of fine terraces. The western shore is higher, well wooded, and checkered with occasional swamps. The tributary valleys are marked by the same moderate elevation of the banks. Those of the western slope abound in timber. Numerous lakes are scattered over the intervening prairie.

Western slope.—The Crow, Sauk, and Long Prairie are the principal streams of the western side.

Crow Valley.—The Crow, which forms the boundary between Wright and Hennepin counties, is the most important of these. Through its north and

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south forks it permeates an extent of country nearly equal to that of the Blue Earth valley, stretching east and west for a length of seventy-five miles, and a breadth at its widest expansion of forty miles. Dense masses of timber, numerous groves and fat prairie uplands characterize the valley of this stream, while its sources are fed by numerous beautiful lakes. It occupies portions of the counties of Hennepin, Wright, Carver, McLeod, Meeker, Kandiyohi, and imparts to each the characteristics which make this valley one of the most inviting districts ofMinnesota, scarcely equalled elsewhere in fertility and beauty.

Sauk Valley.—The Sauk valley, mainly occupying the large adjacent county of Stearns in the north, though of less extent than that of the Crow, resembles it in its profusion of timber and lakes and the fertility of its soil. The Sauk river forms generally the line of demarcation between the timbered belt of the eastern slope of the Mississippi and the naked savannahs that stretch southward to the upper Minnesota valley. Its eastern shore is beautifully wooded, while its western terminates a plain apparently boundless. The dense settlements which are rapidly forming along its eastern border prove its superior agricultural capacity.

Long Prairie.—Long Prairie river, draining the interval between the Sauk valley and Crow Wing river, affords a fine stretch of wooded country along its banks, occupied by the counties of Todd and Douglas. Douglas county is especially remarkable for the sylvan beauty of the lakes and groves and pleasant interglades of prairie which characterize the sources of the Long Prairie, Sauk and Chippewa rivers. The whole western slope from Lake Minnetonka to Sauk valley is occupied by dense masses of wood, known as the Big Woods, intersected by small prairies and meadows, covered with deep grasses, which mark the extreme fertility of the soil, and dotted with myriads of beautiful lakes. From Sauk valley to Crow Wing is a heavy forest growth on a light, sandy, but nutritious soil, south of which stretch wide and rich savannahs.

Eastern slope.—The eastern slope is traversed by the Rum river, the Elk, the Platte and other streams, which rise in the highlands and lakes of the great summit level, and crossing broad belts of pine at their upper extremities, flow through a low undulating plain, covered with clusters of lakes, tamarack swamps, meadows and oak openings, with a thin sandy soil on the highest ridges and intervening masses of great fertility, in all the slopes and depressions. For detailed description below the belt of pine, this section may be thus divided: From St. Anthony falls to Rum river, rolling prairie, with oak openings beautifully interspersed, soil sandy but rich in organic ingredients; from Rum river to Elk river, open undulating prairie, sparsely wooded. Beyond Elk river, an excellent soil, prairies interspersed with beautiful parks of oak.

The Rum river, rising in Mille Lacs, drains more than half the eastern slope. Its valley has a length, nearly due south from Mille Lacs, of sixty-six miles, with an average breadth of twenty miles, occupied by the counties of Anoka, Isanti, Monroe, and Mille Lacs. It is important as the seat on its northern affluents of considerable pine forests, the product of which finds an easy passage through its channel to the mills at Anoka and St. Anthony. The nature of the soil, though light, is also favorable to settlement. The Elk river, which drains the counties of Benton and Sherburne, and the Platte, which drains Morrison county, give no features to the country which have not been already described.

(4.) *St. Croix Valley.*—The St. Croix river rises in Wisconsin, but its principal branches, the Kettle and Snake rivers, belong to Minnesota. They rise in the highlands of Lake Superior, and crossing great forests of pine in their rapid descent along the declivity of that region, break at intervals through the trap rocks in falls and rapids, and thus afford, with an exhaustible supply of timber, a water power adequate to its manufacture. Below latitude forty-six, the country bordering the St. Croix, though heavily timbered with hard woods, has a rich soil, which proves more attractive to the hardy husbandman of northern Europe, even with the labor of clearing, than the lighter loam of the prairies. In its lower sections it presents a succession of oak openings of great beauty

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and fertility. Washington county, lying along the beautiful banks of Lake St. Croix, Chisago, Pine, Kanabec, Buchanan and a large part of Carlton and Aiken counties, belong to this valley. The St. Croix valley has an area in Minnesota of 3,700 square miles. The valleys of the Kettle and Snake rivers, which are depressed but little below the general level of the country, are occupied mainly by swamps and natural meadows, bearing a luxuriant growth of grass five or six feet in height. This grass makes a coarse, sweet hay, of great use in the pineries.

(5.) *The Lacustrine Summit Level*—From its source in Lake Itasca to Crow Wing, the Mississippi describes three-quarters of an immense circle which is completed by the Crow Wing. With the affluents of the Mississippi the circle expands to the semi-lunar curve of the Height of Land with a diameter of one hundred miles. This hydrographical ring, which is closely interlinked with the intrusive sources of the Red river and St. Lawrence, is scarcely less remarkable for the majestic systems of inland waters to which it gives rise, than for the extraordinary number of lakes which press around their sources. Leech lake, Cass lake, Lakes Winnebigoshish and Itasca, and innumerable minor groups form an immense system of lacustrine reservoirs, pouring at all points into the Mississippi and giving it the volume of a navigable river in the close vicinity of its sources. From Crow Wing nearly to Pokegama falls, a distance of two hundred and forty-six miles, the river has an average breadth of ninety yards, and has been proved to be navigable for steamboats. The soil of all the valleys on the southern slope of the watershed is lacustrine, and it is a notable fact, observed by Norwood, that this whole district is undergoing a process of drainage, and so rapidly that a large addition to the tillable land of the state may be calculated upon at no distant period.

On this portion of the declivity the shores are of moderate elevation and bordered generally with low alluvial bottoms sustaining a dense growth of hard woods. On either side the country is broken up into low oblong knolls, covered with a sandy loam of variable fertility, with gently undulating valleys between, interspersed with rice lakes, meadows, ponds and bogs, and threaded with streams. Above the falls we ascend to the broad summit level, an interminable labyrinth of streams and lakes, some of the latter of large size, separated by low savannahs and narrow sandy ridges covered with pine, the alluvial bottoms with a dense forest of hard wood. This region contains excellent land where the calcareous clay subsoil breaks through the layer of superincumbent sand which overlays the ridges.

It is a sufficient indication of the agricultural capacity of this district that corn, which can not be cultivated at Sault St. Marie, is annually raised by the Indians at the sources of the Mississippi. The abundance of the rice plant and cranberry redeems the marshes which they cover.

(6.) *The Superior Slope, including the Valleys of St. Louis and Rainy Lake Rivers.*—The northern shore of Lake Superior is generally rock-bound, from one to two hundred feet high, indented with numerous bays, rising with an abrupt declivity of five or ten miles in width to a craggy range of hills, from five to nine hundred feet high, and cut by numerous gorges, through which the streams break their way, which drain the country beyond. Beyond this rugged rim a series of hilly ranges called in Canada the Cabotian mountains—an outbreak of primary rock covered with drift—stretches across the country parallel with the Superior shore till it ends in the heights of land which separate the Superior from the Mississippi basin. The St. Louis river which empties into the head of the lake, passes through this mountain chain transversely from north to south, presenting a series of magnificent views and cataracts in its descent. All the ranges are separated by valleys of from 200 feet to two miles in width, coursed by small streams expanding into beautiful lakes and tumbling in picturesque cascades. The hills are sandy and sterile, supporting a small growth of soft and hard wood. The valleys have a good soil, but often valueless from the swamps which intersect it, and are covered with a thick growth of soft wood.

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A large portion of the Rainy river valley lies north of the mountain ranges. Of this, Sir George Simpson in his "overland journey" writes:

"From Fort Francis downwards, a stretch of nearly a hundred miles, it is not interrupted by a single impediment; while yet the current is not strong enough materially to retard an ascending traveler. Nor are the banks less favorable to agriculture than the waters themselves to navigation; resembling, in some measure, those of the Thames near Richmond. From the very brink of the river there rises a gentle slope of green-sward, crowned in many places with a plentiful growth of birch, poplar, beech, elm and oak. Is it too much," he continues with enthusiasm, "for the eye of philanthropy to discern through the vista of futurity, this noble stream, connecting as it does the fertile shores of two spacious lakes, with crowded steamboats upon its populous towns on its borders?"

The immediate declivity of the north shore for a breadth of twenty miles, though covered with a dense forest of the hard and soft woods, is capable of profitable cultivation. Its chief value however is in its mineral resources, which are of undoubted though undeveloped richness.

This district is occupied by the counties of Lake and St. Louis, with a front on the Lake and by a corner of Carlton county on the St. Louis river. The Superior slope has an area of 15,000 square miles.

(7.) *The Red River Valley.*—The American valley of the Red river is about 250 miles from the north to south, and on the Minnesota slope, bounded by a line drawn from the head of Red lake to Otter Tail lake, is about 68 miles wide, giving an area of 17,000 square miles.

"In its whole extent," says Pope in his official report to Congress, "it presents an almost unbroken level of rich prairie, intersected at right angles by all the heavily timbered tributaries of the Red river from the east and west, the Red river itself running nearly north through its center and heavily timbered on both sides with elm, oak, maple, ash, &c. This valley, from its vast extent, perfect uniformity of surface, richness of soil, and unlimited supply of wood and water, is among the *finest wheat countries* in the world."

Again he says:

"I ascended the Red river in boats from our northern frontier at Pembina to Otter Tail lake and found it navigable for boats for nearly four hundred miles of its course to the mouth of the Sioux Wood river, [present site of Breckenridge."]

The Red lake, Wild Rice, Buffalo, and Otter Tail, the principal streams on the Minnesota side, all head in forests of pine. All the great plain of the Red river is alluvial, resting on drift and limestone, with a black, strong soil, one to three feet deep on a clay subsoil; below the mouth of the Red lake fork, strong chalybeate springs ooze from the clay banks; saline springs have also been discovered; and in addition to these particulars, Dr. Owen mentions that "the air along Red river from the mouth of the Psihu to the Pembina settlements, (latitude 47 to 49,) is scented during the months of June and July with a delightful perfume arising from the wild roses, which form a thick shrubbery along its banks." Very probably the margins of the Red river will be subject to inundation in the spring, but all accounts concur that no more productive region or better adapted to the small cereal grains exists in the northwest.

Otter Tail Lake.—The region around Otter Tail lake is thus described by Pope, whose praises are amply corroborated by Owens:

"To the west, northwest and northeast, the whole country is heavily timbered with oak, elm, ash, sugar maple, birch, &c. * * * * To the east the banks of the lake are fringed with heavy oak and elm timber to the depth of one mile. The whole region of country for forty miles in all directions, is one of the most beautiful and fertile in the world. The fine scenery of lakes and open groves of oak timber on the prairies, of winding streams connecting them, and beautifully rolling country on all sides, renders this portion of Minnesota the garden spot of the northwest. It is impossible in a report of this character, to describe the feelings of admiration and astonishment with which we first beheld this charming country, and were I to give expression to my own feelings respecting it, I fear they would be considered the ravings of a visionary or an enthusiast."

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10. The Lakes of Minnesota.

The lakes of Minnesota, remarkable for their number and beauty, play a conspicuous part in its system of waters, and with their sylvan associations, form the prominent charm of its rural landscape. In reference to this predominant feature of its local physiognomy, the aboriginal inhabitants of Minnesota were called the "People of the Lakes,"—and to Lieut. Maury we owe the suggestion that this distinction be perpetuated in the designation of the *Lake State*. He adds:

"There is in this territory a greater number of these lovely sheets of laughing water, than in all the country besides. They give variety and beauty to the landscape; they soften the air, and lend all their thousand charms and attractions to make this goodly land a lovely place of residence. We see that, with these beautiful sheets of water, nature has done for the upper Mississippi, what Ellett proposes should be done by the government for the Ohio, and what Napoleon III is doing for the rivers of France.

"Every one of these thousands of lakes is a reservoir for the rains in the wet season, which it reserves to fill up the river in the dry—at least, that is one of their offices, for they have many. The consequence is, that though more water falls from the sky upon Minnesota, in summer, than you in New York receive in winter or spring, yet the Mississippi there is never flooded. The difference between extreme high and low water at St. Paul, is not more than six or eight feet, while further down, as at Memphis, the difference is many times as great. The difference on the Ohio, I think, is upwards of thirty feet.

"Minnesota is far from the sea, but it is a better watered country than either Kansas or Nebraska. Indeed it may be considered the best watered State in the Union, and it doubtless owes its abundance of summer rains measurably to this lake system."

These lakes are scattered in chains and groups or isolated gems all over the State, forming an immense system of natural reservoirs, feeding the sources of all the streams and supplying the atmosphere with perennial supplies of moisture for the summer months. These lakes are formed by excavations in the great drift stratum upon beds of impervious clay which underlie the sand plains and towns. Schoolcraft estimates that there are ten thousand of these lakes in Minnesota; a great exaggeration, no doubt, but illustrative of the impression which experience conveys of their number.

Classification of Lakes.—In reference to their hydrographical position these lakes are referable to two classes. The first includes those which belong to chains occupying the divides, and are the sources of nearly all the streams of the State. They are generally connected by small streams or rivulets, or are formed by the expansion of larger streams in basins from one to two miles in diameter. To this class may be also referred a large number of lakes, isolated in the dry season, and connected during the spring rains, by streams that flow along intervening valleys, once the beds of large water-courses, but now elevated above the water level and converted into meadows, cranberry marshes and swamps. Between a great proportion of the isolated lakes east of the Mississippi old connexions of this kind may be traced.

Many of the largest lakes of this class are situated on the broad summit level of the great watershed, and in some instances are tributary both to the Mississippi and Lake Superior, or the waters of Hudson's Bay. Such an interlockage is said by Norwood to exist between the sources of Big Fork river, which sends its sources to Hudson's Bay, and one of the tributaries of Lake Winnibigoshish, through which the Mississippi flows. The second and most numerous variety of lakes are wholly isolated, having no apparent outlet or source of supply except the drainage of the surrounding hills. These classes are distinguished by marked differences of physiognomy. The lakes having outlets are usually much larger than those having none, being from one to thirty miles in diameter, and of very irregular outline. The isolated lakes are generally of a circular, oval, or crescent form, from one to two or three miles in diameter. The second class are generally distinguished also for their clear, white, sandy shores, set in gentle, grassy slopes, or rimmed with walls of rock, their pebbly beaches sparkling with carnelians and agates, while the oak grove or the denser wood,

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which skirts its margin, completes the graceful and picturesque outline. To the first class, those connected in chains, belong the larger number of lakes having swampy margins, containing large fields of wild rice, while their shallow waters are filled with aquatic plants.

Rice Lakes.—These rice lakes are principally distributed upon the slopes and summits of the great watershed. They serve not only as a prolific natural granary for the Indians, who gather their annual supplies in August and September, but they invite myriads of water fowl, and thus form a double resource.

Cranberry Marshes.—The swampy borders of these lakes are thickly covered by the cranberry, which is gathered in large quantities for export.

Purity of the Water.—These lakes consist of transparent, generally very pure and sweet water, with a temperature 8 or 10 degrees below that of the atmosphere, and "abound with various species of fish, of a quality and flavor greatly superior to the middle or (other) western states. The shores of many of them were chosen as the sites of villages by the Indians, who showed their taste by selecting the most beautiful and picturesque."

The Zodiac of Lakes.—In reference to their geographical distribution, these lakes are scattered profusely all over the State, with the exception of the narrow limestone district on the lower Mississippi, and the valley of the lower Red river.

The whole belt of country lying along north and south between the northern limit of the watershed and the sources of the Blue Earth river, with a width of a hundred miles, may be described as a broad zodiac of lakes, within which they are clustered in brilliant constellations. Of local groups, the most remarkable for their number and size are those which lie upon the dome of the watershed, while the extreme southern cluster in the Blue Earth valley forms the Undine region of Nicollet.*

11. Distribution of Timber.

The character of the trees is an unfailing index of the nature of both soil and climate.

(*a.*) *The Great Coniferous District.*—The elevated and broken region north of latitude 46° and east of the meridian of the outlet of Red lake, may be described in general terms as *a forest country*—these lines in general being the southern and western limits of the pine and other coniferae in Minnesota, and including an area of 21,000 square miles. The pine is the prevailing wood of this district, but intermingled with a considerable proportion of birch, maple, aspen, ash and elm. The alluvial bottoms of the extreme northern rivers of the Mississippi support a heavy growth of basswood, elm, aspen, butternut, ash, birch, hard and soft maples, linden, balsam firs, and some oaks. It is observed that whenever the cone-bearing woods are burned off in this district, the hard woods take their place. The sugar maple which, according to Blodgett, marks the range of Indian corn, extends northward nearly to Rainy lake, where it yields abundance of sugar to the Indians. In the Red river valley the sugar maple is found all along its trough, and finds its northern limit beyond the 49th parallel on the elevated southern watershed of Lake Winnipeg. On the rivers flowing into Lake Superior, hemlock, cedar, spruce, fir, and birch, prevail.

The Zone of Pine.—The principal pine forests of Minnesota, which constitute one of its main resources of industry and wealth, stretch in a broad belt near the southern border of the great northern forest district, from the eastern side of Pine county, in the Upper St. Croix valleys, north-westward across the watershed to the outlet of Red lake. The principal pineries where lumber is bought, are upon the head waters of Kettle, Snake, Rum, Crow Wing, and the Upper Mississippi, and recently upon the extreme upper waters of the Red or Otter Tail river.

Belt of Oak Openings.—Below latitude 46°, the pine, hemlock, spruce, birch, and all the *coniferae* generally disappear with the forest line. A narrow range

* We have in course of computation the number and superficial contents of the lakes of Minnesota, with a descriptive list of those distinguished for their size and beauty. The results will appear in our next volume.

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of cedar and tamarack swamps between St. Croix and Crow Wing rivers, and some pine, mingled with large maple, oak, ash, and small birch and spruce, intervene for half a degree further, when the oak becomes the prevailing tree on the uplands, distributed in groves and large parks, its growth usually dwarfed by the annual ravages of prairie fires. These oak openings characterize the whole delta of rolling prairie below latitude 45° on the east side of the Mississippi. The soft maple, elm, ash, willow and alder, line the bottoms of the Rum and Elk rivers. There are no compact forests in this section, except upon the St. Croix valley, where a dense mass of hard woods, in which the sugar maple prevails, occupies the upper part of Washington and Chisago counties, to the pine belt in Pine county.

The Bois Franc, or Big Woods.—West of the Mississippi, the western flank of the Great Coniferous Forest of the north, extending with a thick border of hardwood, west of Otter Tail river and around Otter Tail lake, terminates upon the valley of the Crow Wing, where it merges its characteristics in a new forest growth of the deciduous forms which stretches in a broad angular belt across the great prairies of the south-east and south, and known generally as the Big Woods. This belt of woods forms a deep fringe, of from ten to twenty miles in width, along the western slope of the Mississippi, from the Crow Wing valley to the Sauk at St. Cloud. Crossing into the valley of the Crow river and keeping a general south-easterly course, it occupies a large strip of country between the Mississippi and Minnesota rivers, nearly one hundred miles on its longest side, with an average breadth of forty miles; its western limit being formed by a line crossing the counties of McLeod and Meeker, diagonally through the middle, and its eastern by a line drawn from near the mouth of Rum river to Carver, on the Minnesota.

Throwing its left flank across the Minnesota at Louisville, its main body crosses the river between Belle Plaine and Le Sueur, and covers nearly the whole of Le Sueur county, with its right wing extending south-westward to Blue Earth river, in Blue Earth county, and its left occupying about one half of Rice and Scott counties. The area of the tract of country covered by the Big Woods is about 5,000 square miles, of which 4,000 is occupied by the division north of the Minnesota, and 1000 by its southern division. This woodland district is full of lakes, and in some sections the dense mass of forest is broken by small prairies. The varieties of timber in this district are mainly oak, maple, elm, ash, basswood, black-walnut and hickory.

Southern Belt of Valley Woods and Oak Openings.—Besides the tract above described, there are no large forests in Minnesota, west of the Mississippi. But nearly all the streams have narrow fringes of woodland, and some of the valleys east are dense masses of timber. The wide bottoms of Minnesota and Mississippi have a deep border of thick and massive woods, in which the huge cottonwood and maple are conspicuous, with white and black walnut, butternut, lime, linden, box-wood, and hickory. The Zumbro valley, Wabashaw and Dodge counties, supports some large tracts of forest growth. The Root river also affords a considerable body of thick woods on the boundaries of Fillmore and Olmsted counties, in which all the varieties of the Big Woods are reproduced. But the oak openings, and groves which are scattered through the uplands along the streams form a large resource of the prairie population, for domestic and mechanical purposes.

The Sparsely Wooded District.—The upper valley of the Minnesota and Red river, sustain no forest growth except upon the trough of the main and tributary streams and the margins of the lakes. The minor streams of the Upper Minnesota are, however, poorly timbered, a few scattering trees only marking their course over the naked plain.

On the Red river a narrow fringe of thick woods, of the hard varieties, commences at Graham's point, and continues to Pembina, while all the streams on the east and west sides afford narrow parallel strips of timber, generally from fifteen to twenty-five miles apart, while the intermediate plains above latitude 46° are dotted with clumps of poplars, willows and other aspenoids.

In table II, the statistical details of the distribution of timber, by counties, is

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given for the surveyed districts, so far as access could be had to the surveyed plats. The general facts of forest distribution may be thus stated.

	Square Miles.
Northern Forest Region, (estimated,)	21,000
The Big woods, or deciduous forest, (estimated,)	5,000

The areas covered by oak openings are in process of computation, but can not be yet stated.

12. Geological Outline.

Some attention to the geological structure of the country, is necessary to an understanding of its physical outlines. The Superior basin of the St. Lawrence is terminated on the west and north by an immense development of the primary rocks, complicated by local disturbances, and stretching from Labrador and James Bay, west of Lake Superior, and north of the watershed, in broad granitic and trappean ranges, overlaid by huge deposits of clay and drift, and disappearing to the west, under the argillaceous drift deposits of Red river valley. This range of transverse rocks which, with all its diluvial covering, does not rise over 1,680 feet above the ocean, may be said, by its "rocky roots," to continue west from the Itasca highlands, and to divide the waters of the upper Missouri from those which flow into Lake Winnipeg.* The deep stratum of drift which covers the uplift of this formation, west of Lake Superior, constitutes the heights of land which skirt the summit level of the Mississippi, and give origin to the three great river systems of the continent. From the head of Lake Superior a narrow granitic spur of this primary rock, divested of the volcanic debris in which the mineral wealth of Lake Superior is imbedded, stretches southwardly under the drift, beyond the western boundary of the state, revealed only where it crosses the Mississippi at Sauk Rapids, the Minnesota between the Cottonwood and Red Wood, and the Big Sioux at Sioux falls. This granitic seam intervening in the sandstone, has a breadth upon the streams which it crosses of from forty to fifty miles south of the watershed. Except a narrow strip of limestone on the south-eastern border of the state, its whole remaining surface is covered with drift, overlying rocks of the lower Silurian period.

The lowest sandstones protruding upon the south-west shore of Lake Superior, under a covering of drift and red marls, upon the upper St. Croix down to Taylor's falls, and upon the northern and eastern bank of the Minnesota along nearly its whole course, and at Crow Wing, constitute the basis of the drift stratum for the whole area between these points.

The banks of the St. Croix below Taylor's falls, and of the Mississippi below the falls of St. Anthony, reveal a rapid ascent from the sandstone to the magnesian limestones, the lower member of which comes to the surface at those points, whence the country gradually rises in the geological gradation till it reaches the lead-bearing limestone of Iowa, which supervenes at Lake Pepin, till the series culminates in that direction in the great coal measures of Iowa and Illinois. This limestone district, which, as a surface formation, is nearly defined on the north by a line drawn from St. Croix falls to St. Anthony falls, includes the whole western slope of the Mississippi south of the Minnesota river, and forms a belt from twenty to fifty miles in width. This limestone extends under the drift for long distances through the valleys of the Minnesota and St. Croix, the last exposure on the Minnesota being seen about half a mile above the mouth of the Blue Earth river. Under the drift covering of the Blue Earth valley the Cedar limestones of Iowa, which separate the upper magnesian from the carboniferous rocks, mark the ascent to the west in the direction of the coal measures. Starting from the sandstone of the upper Mississippi as a base, the same range of ascent is developed to the north-west, in the evidences of underlying limestone which are found along the Red river and Otter Tail valleys overlaid with deep argillaceous drift deposits, and beyond the limestone, which comes to the surface near the mouth of Red river, and along the western shores of Lake Winnipeg, to the tertiary and cretaceous formations observed by Nicollet on the James and upper Missouri.

* Schoolcraft.

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13. Mineral Resources.

Coal.—According to all analogies coal ought to occupy the geological interval between the limestone of Minnesota and this cretaceous formation on the upper Missouri; and Featherstonaugh says, that the cretaceous rocks of the Missouri rest upon the carboniferous limestone of the Big Sioux. The coal formation, then, doubtless exists in Dakota, but probably overlaid with superficial deposits so as to be of little economical value. Owen and others decide, conclusively, against the existence of coal on the Blue Earth, the erratic specimens of lignite often found in its banks having, probably, been brought down in the great drift movement from the concealed coal beds of Dakota.

According to a letter of Hon. H. R. Schoolcraft, addressed to Silliman's Journal of Science, coal was found a year or two ago in the district south of the Lake of the Woods, a region too inaccessible, if the story be true, to give a practical value to the discovery. There is probably no coal within the limits of Minnesota. But its close proximity to the coal fields of Iowa will give it, when its railroad communications shall have been developed, a cheap access to a generous supply of this mineral. The coal fields of Iowa cover an area of 25,000 square miles, affording productive coal measures one hundred feet thick, in veins of from four or five feet.

Lead and Copper.—According to Dr. Owen, the lower magnesian limestone, and even the sandstone in Goodhue and Wabasha counties, on Lake Pepin, are metaliferous, yielding lead and copper. The latter is a hydrous bi-carbonate, mixed with some siliciate of copper or copper pyrites, yielding from ten to twenty per cent. of metallic copper. The lead ore is a sulphuret similar to that occurring in the Dubuque and Mineral Point districts. Recent discoveries have corroborated the indications found by Dr. Owen, but no mines have yet been attempted.

Copper and Iron District of Lake Superior.—In the mineral belt along the northern shore of Lake Superior, copper veins of great richness and in very large masses are said to have been found, and which promise to develope a wealthy and prosperous community in a region generally unfitted for profitable agriculture. Many very rich specimens of pure copper ore have been obtained from Knife and Stuart rivers. Around Portage and Pigeon rivers iron ore is deposited in considerable thickness. It is exceedingly to be regretted that we have no authentic information upon this important subject. Next to its agriculture there is no element of wealth in the natural resources of the state which promises a richer harvest than the mineral fields of the North shore, if we may trust the inferences of geologists from the superficial explorations already had. A thorough examination by a competent geologist would doubtless develope facts, whose practical bearing upon the development of this important part of the state, would repay a hundred fold the expense of the experiment. A step in this direction has already been taken in the appointment of Dr. C. L. Anderson as geologist for the state, but without funds to give efficiency to the commission. The South shore, in the trap ranges of Michigan, said to be inferior in its surface indications to the Minnesota side, yields some of the richest qualities of copper and iron ore in the world.

Copper.—The copper mines of the Michigan shore have been worked since 1845 with constantly increasing success. The following tables exhibits the results of mining for fifteen years in this district.

Copper product of Lake Superior.

	Tons.		Tons.
1845,	11.3	1852,	1,047
1846,	25.3	1853,	1,396.6
1847,	236.7	1854,	2,095.7
1848,	517.1	1855,	3,370
1849,	754.5	1856,	3,844
1850,	645.2	1857,	4,399.9
1851,	921.3	1858,	4,630.7
Total,			23,617.7

Total value of 23,617.7 tons, at $500 per ton, $11,853,850.

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The cupriferous trap range extends into Wisconsin, and has at various times been examined by the geologists of the United States survey of that state and by other explorers. The results of these examinations have not been particularly favorable for copper, but promise better in iron. The only company at present in operation in this region is the "Fond du Lac." No shipments have yet been made from the Wisconsin district.

On the north shore of Lake Superior, within the British Dominions, and the islands adjacent thereto, mining has at various times been carried on with various success. No workings are at present going on here, but from 1846 to 1849 a rich vein was worked on Spur island and the mainland opposite Prince's bay. The mine, however, proved unremunerative, although it contained large quantities of native silver. A number of localities were also formerly worked on the north-east side of the lake. In 1846 operations were commenced on a large scale at Pointe aux mines, Mica bay, but without success. The existence of large copper deposits on the north shore has, however, been abundantly proved.*

Iron.—Iron is by far the largest product, and, though recently developed, the increase has been remarkable. The following are the shipments of iron ore for four years.—See table in Appendix.

1855, 1,447 tons. 1856, 11,597 tons. 1857, 26,184 tons. 1858, 31,035 tons. And of wrought iron as follows:

1856, 1,040 tons. 1857, 1,325 tons. 1858, 2,597 tons.

Gold, Cornelian and Agates.—During the summer of 1858 the people of the southern Minnesota were thrown into a state of great excitement from reported discoveries of gold on the Zumbro. It is possible that a minute diffusion of gold dust might have been found in the black earth on the banks of that stream, probably brought down by fluviatile action from the disintegration of the mineral veins of Lake Superior, from the prostration of whose volcanic masses, according to geologists, the rich quartz fragments, cornelians, agates and chalcedonies, which line our lakes, were distributed by aqueous action; but it seems more likely to have been particles of micacious sand, which have a close resemblance to gold dust.

Limestone for Building.—The limestone which crops out near the surface along the banks of the Mississippi and its tributaries, in situations favorable for quarrying, afford mines whose economical value for building purposes compensates us to some extent for the absence of more precious minerals. The limestone formations nearest the surface, such as those which form the plateau on which St. Paul is built, have been found especially valuable. It is a grayish buff-colored rock, lying in layers of from four to twelve inches in thickness, easily quarried and easily worked, though not capable of a high polish. Under this, as at West Saint Paul, St. Anthony and elsewhere, is a hard, close-grained limestone of bluish gray color, which is the favorite building material of the state. At St. Peter's occurs a limestone resembling marble in its structure, and capable of a fine polish.

Lime.—These limestone formations which crop out upon all the bluffs of the Mississippi and its tributary streams below St. Anthony Falls, upon the surface or under the drift, contain a large per centage of carbonate of lime, which makes it very valuable for burning.

The following analysis of its properties will show its comparative excellence for this purpose in various localities.

Localities.	Carbonate of Lime.	Carbonate of Magnesia.	Insoluble matter.	Alumina Oxide of Iron.	Water and loss.	Total.
1. From the shore of Lake Pepin,	52	42.2	4.3	0.9	0.6	100
2. On Lake St. Croix, below Stillwater,	48.3	36.8	6.9	4.3	3.7	100
3. Gray Cloud Island,	51.4	40.7	a trace.	4.6	3.3	100

* Journal of American Geographical and Statistical Society.

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Localities.	Carbonate of Lime.	Corbonate of Magnesia.	Insoluble matter.	Alumina Oxide of Iron.	Water and loss.	Total.
4. Thirty miles below Lake Pepin,	29.7	9.7	60	0.9	—	100
5. Half a mile below Fort Snelling,	64.85	13.75	12.40	7.50	1.50	100
6. At same place, underlying above,	42.60	28.46	14.16	7.83	6.93	100
7. Six miles below Traverse des Sioux,	58.65	29.15	7.25	1.55	3.40	100
8. Two miles below mouth of Cotton-wood river,	90.	00.6	4.4	3.4	1.6	100

Specimen No. 8, at the mouth of the Cottonwood, affords the purest limestone in the state for burning.

Specimen No. 6 in the bluffs near Saint Paul is the next in value.

The first four analyses are by Dr. Norwood, the remainder by B. F. Shumard, of Owen's Geological corps.

Iron in Blue Earth Valley.—The only mineral which promises to be of much value in this section of country, according to Dr. Owen, is a bed of nodular iron stone, found at a number of localities both on the Blue Earth and Le Sueur rivers, at the base of the drift, resting either on magnesian limestone or sandstone, in continuous bands several inches in thickness. "This argillaceous bed of carbonate and hydrated brown oxide of iron varies from one to three feet in thickness." As the value of this ore does not seem to be properly estimated in the locality where it exists, the following tests of its properties by Dr. Owen may direct attention to an unsuspected field of enterprise.

After pounding and sifting the raw ore a quantity weighing 1,225 grains was roasted, after roasting it weighed 865 grains; loss by roasting, 360 grains, being equal to 29.4 per cent. The color after roasting was a purple brown; an assay then made yielded a button of light gray iron, weighing 377 grains, equal to 43.5 per cent. of the roasted ore and 31 per cent. of the raw ore.

Quartz-ose Sandstone for Glass Making.—Superimposed on the limestone there occurs near the mouth of the Minnesota, a sandstone remarkable for its whiteness, fineness and purity. This rock forms the base of the bluffs at Fort Snelling and along the Mississippi from Red Rock to the Falls of St. Anthony, and varies in thickness from forty to one hundred feet. So loosely cemented and friable is this rock that at Saint Paul, when its steep exposure under the limestone crest of the bluffs gave the locality its early Indian name of Imnijaska or White rock, a number of subterranean sewers have been excavated under the city, for long distances. Beer cellars of great extent, with wide subterranean galleries, have also been dug in its soft but tenacious bed, and the low white arches and winding aisles of the famous Fountain Cave, are formed of the same material.

This sandstone is made up of grains of limpid and colorless quartz. Nicollet suggests its utility for the manufacture of glass. Norwood says that it is even purer than the celebrated Linn sand used by the Scotch glass manufacturers in making flint glass, and equally well adapted for that purpose, and quite as pure as the quartz-ose sand obtained in Missouri and used in the glass-houses at Pittsburg.

His analysis of this rock gave but two-tenths of one per cent. of foreign matter, which is alumina with a trace of carbonate of lime. Six parts of the purest of this quartz-ose sandstone fused in a crucible with two parts of carbonate of potash and one of lime produced a glass of similar quality and color to that obtained from Linn sand in the same way.

Except in the instance here given we have not been able to ascertain whether this sand has ever been practically tested in the manufacture of glass. In selecting specimens for that purpose it should be remembered that the upper layer of this sandstone is by far the purest.

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Clays.—The bluish clay which underlies the soil in a large portion of the state is used for the manufacture of brick of a good quality. The white marl, of which beds occur at Saint Anthony, yields a buff-colored brick of great beauty and tenacity, resembling the celebrated Milwaukee brick, but of more variable color. Similar clay beds occur at Carver, where a kiln and pottery have been established, and a bed of fine porcelain clay is reported in Wabasha county.

14. Comparative Climatology of Minnesota. By D. C. Shepard, Esq.

Preface.—In the winter of 1857–8, the writer, being engaged in preparing a report to one of the railroad companies of this state, had occasion to make some researches into the leading features of its climate, with reference, particularly, to the operation in winter of lines of railroad.

The results of these examinations, which were published at that time, were so surprising, and stood in such striking contrariety to received opinions abroad, that this amplification of them, with a view to correcting, if possible, *some* errors and prejudices, has been attempted.

If the succeeding pages should be devoid of interest, the fault does not proceed from the lack of material at hand, but rather from a want of facility in moulding it into entertaining forms.

Most of the data employed are extracted from the excellent work entitled "Climatology of the United States," by Lorin Blodgett, Esq., the "Army Meteorological Register," and the "Medical Statistics, U. S. Army."

Minnesota, situated between latitude 43½° and 49° and longitude 92 and 96½, has alone the distinction of occupying at once the geographical centre of the Continental Map of North America, and the crest of its great watershed. The giant water system forming the arteries of the internal commerce of a continent have here their rise, and from their sources in her great interior plains and *coteaus* flow the tributaries of Hudson Bay, the Ocean and the Gulf. Seated at the innermost reaches of these great affluents of the ocean, which impinge against her on every side, with an eastern border looking out upon the greatest of inland seas—her gateway to the ocean beyond—washed on the west for three hundred miles by a navigable inlet of Lake Winnipeg, and her centre resting on the fountain-head of the River of Rivers with its navigable tributaries, bearing on their bosoms the ever-increasing volume of a nation's commerce—her geographical position is but the type of her destiny.

Nor is this geographic and hydrographic position her chiefest peculiarity. In the elevation and configuration of her surface and the excessive areas occupied by lakes and streams; in the distribution of moisture in rain and snow through the several seasons of the year; in the great annual range of temperature with its intermediate vicissitudes of heat and cold, and the anomalies therein displayed, for one-half the year, when subjected only to the ordinary tests of comparison, Minnesota has characteristics which are in a measure exceptional, which serve to isolate her from the mass of the states east of the Rocky mountain ranges, and give to her, in common with the vast areas lying to the west and north-west, climatic traits which are almost distinctively her own.

It is to the meteorology of Minnesota, the temperature, rains, snows, and winds, in comparison with well-known districts south and east, and to their effects upon her agricultural capacity, and not to scientific investigations of the causes of these climatic phenomena, that attention will be directed. In the prosecution of this inquiry, a meagre array of well-established facts will be preferred to volumes of specious theory. Correct data, whenever to be obtained, will form the basis of all comparisons, and the guide by which to arrive at reliable conclusions.

Temperature.—A striking characteristic of the climate of Minnesota, and one which first arrests observation, is the great range in mean temperature between the antipodal months of January and July.

Illustrative of this, with other specialties of temperature, the following table, or more properly, descriptive *chart*, is inserted.

The names of places are here arranged in the order of their *latitudes*, from north to south, for the purpose of displaying at a glance, the extraordinary flexion given to the lines of coincident temperature during the progress of the

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year. The column headed "No. of years," gives the duration of the observations, and under their respective heads, will be found the mean temperatures for months, seasons and the year.

Table of places which coincide with, or nearly approximate to Fort Snelling, (Central Minnesota,) in mean temperature, exhibiting geographically, and by latitude, the courses and sweep of the isothermal lines of Fort Snelling, when projected to the Atlantic coast.

NAMES OF PLACES.	Latitude.	No. of Years.	MEAN TEMPERATURES. March.	April.	May.	June.	July.	August.	Sept.	October.	November	Spring.	Summer.	Autumn.	Winter.	Year.
Pembina, Min.,	49 0	7-12					74.4	69.0					71.7			
Michipicoten, Lake Sup.,	47 56														16.6	
Temiscaming, Canada,	47 19	2													15.0	
Quebec, Canada,	46 49	10									31.5				13.3	
Sault St. Marie, Mich.,	46 30	31									32.5				18.3	
Houlton, Me.,	46 07	17									30.8				16.4	
Montreal, Canada,	45 31	9									32.2			45.5	16.0	
Saint Paul, Min.,	44 53	35 1-2	31.4	46.3	59.0	68.4	73.4	70.1	58.9	47.1	31.7	45.6	70.6	45 9	16 1	44.6
Lake Simcoe, Canada,	44 48	1												45.8		
Plattsburg, N. Y.,	44 41	11	29.9						58.9	46.5						
Green Bay, Wis.,	44 30	21	31.3						57.2	46.5	34.3			46.0	19.9	44.5
Burlington, Vt.,	44 29	21	31.0						59.6	47.6						45.0
Williamstown, Vt.,	44 07	13													16.4	
Bath, Me.,	43 50	19 1-2														44.5
Hanover, N. H.,	43 43	3													16.1	
Portland, Me.,	43 40	31								46.1				46.3		
Toronto, Canada,	43 39	16	30.4						58.1	45.2				46.6		44.3
Lowville, N. Y.,	43 37	19												45.7		
Portage City, Wis.,	43 31	16	32.6	47.2	58.7	65.6	70.9	67.3	57.8	47.9	32.1	45.5	67.9	46.0		44.8
Oswego, N. Y.,	43 20	9	32.0													
Concord, N. H.,	43 18	10														44.5
Dover, N. H.,	43 10	10 1-2	31.8						58.8	46.4						
Rochester, N. Y.,	43 07	24	33.1	45.7					60.3	48.1		44.6				
Utica, N. Y.,	43 06	23	32.3	44.7					58.4	47.4		44.5				
Fairfield Academy, N. Y.,	43 05	19												46.0		
Milwaukee, Wis.,	43 04	8							61.2							
Portsmouth, N. H.,	43 04	25							58.9							
Port Huron, Mich.,	42 55	17 1-2	33.2													
Cherry Valley, N. Y.,	42 48	15							57.8					46.0		44.2
Troy, N. Y.,	42 43	31		46.8												
Cortland, N. Y.,	42 38	18														44.5
Beloit, Wis.,	42 30	6	33.6	46.6	58.4	68.2	73.9	70.7				45.6	70.9			
Oxford, N. Y.,	42 28	17														44.7
Fredonia, N. Y.;	42 26	18		46.4				68.8				46.1				
Kinderhook, N. Y.,	42 22	17		46.3	57.3							45.8				
Detroit, Mich.,	42 20	13			56.0	65.6		67.5	60.0	47.7		45.9				
Battle Creek, Mich.,	42 20	5 1-2			58.5	68.6	76.2	72.3				47.1	71.2			
Boston, Mass.,	42 20	26		46.4								46.1				
Ann Arbor, Mich.,	42 15	2					73.0									
Chicago, Ill.,	41 52	5		46.1	58.3	62.7	70.8	68.5				44.9	67.3			
Newport, R. I.,	41 30	24										45.9				
Oberlin, Ohio,	41 23	5			59.4	67.6	75.5	71.7					70.2			
New London, Conn.,	41 21	11		46.8				70.1								
Ottawa, Ill.,	41 20	2				70.6										
Hudson, Ohio.	41 15	7			58.1	67.8	72.9	69.8					70.2			
New York City,	40 37	12			57.8	67.8	73.2	73.0					71.3			
Flatbush, L. I.,	40 37	24					72.7	71.4					70.5			
Pittsburg, Pa.,	40 32	22			60.9	69.2	73.0	71.2					71.4			
Steubenville, Ohio,	40 25	12				68.8	73.9	70.5					71.1			
Harrisburg, Pa.,	40 12	13			60.4	70.4	74.1	71.9					72.1			
Lancaster, Pa.,	40 02	8				68.4	73.4	71.8					71.2			
Philadelphia, Pa.,	39 57	10			60.7	68.3	73.8	70.2					70.8			
Marietta, Ohio,	39 25	32				69.6	73.5	70.7					71.3			
Hillsborough, Ohio,	39 15	15					72.2	69.3								
Cincinnati, Ohio,	39 07	20					76.5									

Referring to this table, and taking a map of North America, let us trace thereupon, from Fort Snelling, as a radiating point towards the Atlantic coast, a system of lines expressing graphically the temperature of Central Minnesota, for the seasons and year.

Spring (*Mean Temperature* 45 6-10.)—Starting from Fort Snelling, latitude 45° the isothermal line for the spring, forced to the westward by the retarding influence of the great lakes, trends away to the south-east over nearly four degrees of latitude, passing through Beloit, Wisconsin, and rounding the southern end of Lake Michigan, quite south of Chicago; then rising across Michigan to Detroit, it skirts the northern shore of Lake Erie, bisects the state of New York, and cuts the coast line at Newport, R. I., in latitude 41½°.

Summer (*Mean Temperature* 70 6-10.)—The isothermal line for summer, coin-

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ciden. with that of spring, to the northern line of Illinois, is there borne still farther to the westward, and south of Chicago, where, making a great detour to the north-east, it rises to the southern borders of Michigan, is then deflected again to the south-east across Ohio, passes through southern Pennsylvania, and having spanned five degrees of latitude in its coarse, terminates on the coast, east of Philadelphia. Tracing this line for the single month of July, it is found to coincide with that of summer, until it leaves Michigan, when bending abruptly to the south-east, it passes through Hillsborough and Marietta, in southern Ohio, and rising to the western border of Pennsylvania, is then merged in the summer line.

Imagine but for a moment the July heat of the great corn and vine growing districts of Ohio, wafted along this line, over six degrees of latitude, to be reproduced, on the plains of Minnesota, in all its original intensity. Let us go a step further and project this line of equal temperature north-westward to the international boundary at Pembina, and there we find, in the record of this single month, the counterpart of the semi-tropical heat of southern Ohio, though *ten degrees* of latitute intervene. Yet, strange as these facts may appear, the first is supported by observations of long duration.

Autumn, (*Mean Temperature* 49 5-10°.)—The representative line of autumn, borne to the south-east along that of summer, until it reaches Central Wisconsin—now that the lakes begin to part with the accumulated heats of summer—is deflected north-east to Green Bay and projected thence directly east across the Lake and Lower Peninsula of Michigan to Lake Simcoe (C. W.,) and nearly up to Montreal, where, swerving to the south-east across Vermont and New Hampshire, it touches the coast near Portland, Maine. It will be seen, by reference to the table, that this line might with propriety be made to depart from the course here given it, so that deflecting to the southward from Lake Simcoe it would cross Lake Ontario, and passing through places central to Eastern New York, rise again to a junction with the first, near Montreal.

Winter, (*Mean Temperature* 16 1-14°.)—The line for this season, coming still more than that for autumn under the ameliorating influence of the temperature of the lakes, is driven to the north through two degrees of latitude, traversing the Upper Peninsula of Michigan, and cutting the eastern end of Lake Superior somewhat north of Sault St. Marie; then moving slowly southward until it reaches Montreal, is there curved suddenly south into central Vermont and New Hampshire, and rises thence into north-eastern Maine.

Year, (*Mean Temperature* 44 6-10.)—This line, being the reduction to a mean of those of the four seasons, moves south-east to Portage City and ascends to Green Bay; thence departing gradually to the southward from the autumn line, it touches Toronto, sweeps across Lake Ontario, reaches near to the southern borders of New York, two and a half degrees south of its origin at Fort Snelling; and bending away to the north through southern Vermont and New Hampshire intersects the coast line at Bath, (Me.,) in lat. 44°.

Having traced upon the map these lines of equal mean temperature, starting from a common source at Fort Snelling, and diverging as they tend towards the east until they embrace seven degrees of latitude, we have in the districts at the east and south cut by these lines, familiar types of the temperature of Central Minnesota for the seasons and year, which may be reviewed in brief, as follows:

Central Minnesota has a mean temperature in spring equal to Central Wisconsin, Northern Illinois, Southern Michigan, Central New York, Massachusetts and Rhode Island; in summer equal to Central Wisconsin, Northern Illinois, Northern Ohio, Southern Pennsylvania and Central New Jersey; in autumn equal to Central Wisconsin, Central Michigan, Northern New York, Vermont, New Hampshire and Southern Maine; in winter equal to Northern Wisconsin, the Upper Peninsula of Michigan, the southern limit of Canada East, Central Vermont and New Hampshire and north-eastern Maine, (with most of which it nearly coincides in latitude); for the entire year equal to Central Wisconsin, Michigan, Central New York, Southern Vermont, New Hampshire, and Southern Maine, and has an annual range in temperature from the summer heat of Southern Ohio to the winter cold of Montreal.

The abruptness of the advance in mean temperature at Fort Snelling in the

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early spring, and its corresponding decline in the late autumn months will not escape the observation of the critical reader. Hence it is that the line of equal mean temperature for the month of May is nearly coincident with that for the summer; or, in other words, the four months from May to August inclusive, may be properly classified as *summer* months, having their equivalents in mean temperature in Northern Illinois, Northern Ohio and Southern Pennsylvania. This is also without doubt nearly true of the first half of the month of September; making a season of summer four and a half months in length, which is superior in warmth to Michigan, New York, and all the New England States. The transition months (for from their constantly and rapidly changing temperatures they are hardly worthy to be called seasons,) are March and April and the last half of September, October and November. Between these two fragments of the year, are grouped the characteristic seasons of Minnesota, summer and winter. The rapid increase and diminution in mean temperature just adverted to is more or less common to all the states north of the Ohio, but gives greater individuality to the opposite seasons here than elsewhere on account of the length of the curve in temperature passed over. It will thus be seen that the climate of Minnesota, so far as temperature forms a constituent element, is one of extremes.

Rain.—The mean fall of water in the form of rain and snow and the proportions, whether of excess or deficiency, in which it is distributed among the seasons and year, forms an interesting feature of climate. A region where moisture is supplied in abundance during the season of vegetable reproduction and dispensed only in moderate quantities for the remainder of the year, is certainly preferable, either in a sanitary point of view or in its adaptation to the pursuits of agriculture, to one constantly saturated with rains or buried in snows in nearly equal measures.

This completeness of proportion in the distribution of moisture obtains in a high degree in Minnesota, as a comparison of the contents of the ensuing table will show:

Rain Table.

Mean fall of rain and melted snow at various places, for the seasons and the year—also the maximum and minimum fall in the winter months.

Depth in Inches and decimals of an Inch.

PLACES.	Spring.	Summer.	Autumn	Winter.			Year.	No. of Years.
				Min.	Mean.	Max.		
Sault St. Marie, Mich.,	5.4	10.0	10.8	2.8	5.2	11.6	31.4	16‡
Houlton, Me. . .	7.6	11.9	9.9	4.0	7.5	10.0	37.0	9
Montreal, Canada,	11.5	11.2	16·6		7.3		47.3	2
Fort Snelling, Min., .	6.6*	10.9	6.0†	0.3	1.9	3.6‡	25.4	19
Burlington, Vt., .	7.4	10.8	9.8		6.0		34.1	20
Hanover, N. H., .	9.9	11.4	10.5		9.1		41.0	18
Portage City, Wis.,	5.6	11.5	7.6	1.9	2.8	3.8	27.5	9
Rochester, N. Y., .	6.8	8.9	9.4		5.4		30.4	19
Prairie Du Chien, Wis.,	7.6	11.9	7.9	1.6	4.0	6.0	31.4	10
Milwaukee, Wis., .	6.6	9.7	6.8		4.2		27.2	7
Albany, N. Y., .	9.8	12.3	10.3		8.3		40.7	27
Detroit, Mich., .	8.5	9.3	7.4	2.8	4.9	6.0	30.1	12
Cambridge, Mass.,	10.8	11.2	12.6		9.9		44.5	12
Muscatine, Iowa, .	11.2	15.1	10.3		6.7		44.3	10
Pittsburg, Pa., .	9.4	9.9	8.2	4.4	7.5	12.0	35.0	18
Athens, Ill., . .	12.2	13.3	9.2		7.1		41.8	10
Mean of all places,	8.5	11.2	9.5	2.5	6.1	7.6	35.5	

* One-half of this quantity falls in the month of May.
† 3.3 inches of this falls in September.
‡ In the winter of 1849. The next less fall was in the winter of 1837—8 inches.

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Contrasting now the fall at Fort Snelling with that at other places, it is less in spring (ploughing and seed time,) than the mean at all places, and less than at any except Sault St. Marie, Portage City, and Milwaukee; in summer, (the season of reproduction,) exceeding that at many, and nearly equal to the mean at all places; in autumn, (the harvest term,) less than at any other, and one-half less than the mean at all; while in winter, it is less than one-third that at Montreal and Houlton, (both of which nearly coincide with Fort Snelling, in latitude and mean winter temperature,) and sustains the same proportion to the mean fall at all places.

The season of vegetable growth from May to September, may be termed the *rainy* season of Minnesota. It is almost as well defined as that of the Pacific coast, and the two are similar, in many respects, except that they stand nearly in contraposition, thus; at San Francisco, Cal., five months, from *November* to *March*, inclusive, the mean fall for five years, is 17.62 inches. At Fort Snelling, Min., five months, from *May* to *September*, the mean fall for nineteen years, is 17.41 inches, or *two-thirds* the total fall for the year. At San Francisco, greatest mean fall in any month, December, 5.34 inches. At Fort Snelling, greatest fall in any month, July, 4.11 inches. Mean fall for the year at San Francisco, 22 inches. At Fort Snelling, 25.4 inches. The similarity in mean distribution is striking, and almost complete, but it extends no farther. The rainy season of the Pacific slope is succeeded by the parching heats of summer, with no drop of moisture to modify their intensity, and vegetation languishes and dies, unless sustained by artificial means; while in Minnesota, the two are joined together and act harmoniously in the work of reproduction, each relieving and softening the other, and the rains gradually die away in the mellowed temperature of autumn. It is a work of supererogation to extol a climate which presents such admirable divisions of moisture and heat among the months and seasons as this.

Winds.—To the courses of prevailing winds, and to their force and duration in spring and summer, much of the warmth and moisture of these seasons in Minnesota must be due.

The atmosphere of the Gulf and Caribbean sea, laden with the vapors and heat of the tropics, is wafted inland, watering and warming the valley of the Mississippi to its northernmost limit. The existence of this valley current has long been known, and every person resident in Minnesota can bear witness to the persistency of southerly winds in the spring and summer months.

The following table, showing the direction and duration of winds for the year, exhibits in a striking light this phenomenon.*

Mean duration of Wind Currents, and the Directions from which they come, in each year, at different places.

Places.	No. of Years.	No. of Days.				Total Days.
		N.	S.	E.	W.	
Fort Snelling, Min.,	12	74	108	81	88	351
Detroit, Mich.,	4	91	83	70	120	364
New York City,	12	109	73	60	113	355
Pittsburg, Pa.,	12	93	65	55	108	321
Cincinnati, Ohio,	16	68	63	46	162	339
Harrisburg, Pa.,	8	51	45	93	162	351

We have here six places representing the states of Minnesota, Michigan, Ohio, Pennsylvania and New York, at five of which *westerly* winds decidedly predominate, while at the sixth (Fort Snelling,) *southerly* winds are equally in excess. Comparing the duration of these southerly currents, the number of days at Fort Snelling is found to be twenty-five per cent. greater than at Detroit, forty per cent. greater than at New York, seventy per cent. greater than at Pittsburg and Cincinnati, and nearly two and a half times greater than at Harrisburg. Should we include the whole number of days in the year on which currents

* This table is compiled from yearly observations by reducing the winds of the eight points of compass to north, south, east and west winds. This is done by adding to the duration of the due north wind, as found recorded, one-half the sum of the N. E. and N. W., to the due east, one-half N. E. and S. E, to the due south, one-half the S. E. and S. W., and to the due west, one-half the S. W. and N. W.

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come from the south-east, south and south-west, in the sum of *south* or *southerly* winds, these places would rank as follows:

Fort Snelling, . .	172 days.	Cincinnati, . . .	109 days.
Detroit, ...	122 "	Pittsburg, . .	102 "
New York, . . .	118 "	Harrisburg, . . .	66 "

Making the duration at Fort Snelling forty per cent. larger than at Detroit and New York, sixty per cent. larger that at Cincinnati and Pittsburg, and two and a half times larger than at Harrisburg, as before; the period at Fort Snelling being but *eleven days less than half the year.*

These facts go very far towards accounting for the exceptional warmth of the spring and summer months in Minnesota, and serve to show that the direction of currents of air exerts an influence only less than the position in latitude in forming the measure of heat and cold.

Frosts.—A correct exhibit of dates of late and early frosts during the season of vegetation in Minnesota, compared with other localities, would doubtless possess unusual interest in its bearings upon the subject of agriculture. Unfortunately, the records necessary to this can not be obtained. The "Register" gives the maximum and minimum temperatures for each month, but does not give the particular day of the month on which they occur, so that the records are only useful for the purposes of general comparison by months. Of course the length of the season of exemption from frost can not be learned with any precision. Still, a careful examination of the following record will lead to conclusions by no means unfavorable to Minnesota, when compared with remote and more southern districts, with regard to the probable duration of this period, and with this view it is inserted.

Record of Minimum Temperatures in Spring and Autumn months, exhibiting Fort Snelling in contrast with other places.

1843.

May.—Minimum temperature at Fort Snelling, Min., 27 degrees; at Prairie du Chien, Wis., Buffalo and Sackett's Harbor, N. Y., 32; Detroit, Mich., 24.

June.—Minimum at Fort Snelling, 35 degrees; Portage City, Wis., 36; Pittsburg, Pa., 33; Harrisburg, Pa., 30.

September.—Minimum at Fort Snelling, 32 degrees; Harrisburg, 34; Sackett's Harbor, and New London, Conn., 32; Troy, N. Y., 33.

1844.

April.—Minimum temperature at Fort Snelling, 30 degrees; Portage City, 32; Detroit, 18; Pittsburg and Baltimore, 26; Buffalo and Oswego, N. Y., 16; Troy, 8.

May.—Minimum at Fort Snelling, 32 degrees; Detroit, 30; Pittsburg and Buffalo, 36; Troy, 34.

September.—Minimum at Fort Snelling, 33 degrees; Portage City, 31; Detroit, 34; Pittsburg, 35; Buffalo, 33; Troy, 32.

1845.

May.—Minimum temperature at Fort Snelling, 38 degrees; Prairie du Chien, 35; Portage City and Pittsburg, 32; Detroit, 31; Buffalo, 29; Troy, 35; New London, 33.

September.—Minimum at Fort Snelling, 40 degrees; Detroit, 36; Pittsburg, 39; Troy, 40; Plattsburg, N. Y., 33.

1846.

May.—Minimum temperature at Fort Snelling, 43 degrees; Detroit, 40; Pittsburg, 38; Sackett's Harbor, 33; Troy, 38.

September.—Minimum at Fort Snelling, 41 degrees; St. Louis, 42; Pittsburg, 45; Troy, 44.

1847.

May.—Minimum temperature at Fort Snelling, 30 degrees; Pittsburg and Troy, 34.

September.—Minimum at Fort Snelling, 39 degrees; Pittsburg, 42; Troy, 44.

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1848.

May.—Minimum temperature at Fort Snelling, 39 degrees; St. Louis, 40; Pittsburg, 34; Troy, 36.

September.—Minimum at Fort Snelling, 34 degrees; Harrisburg, 32; Pittsburg, 38; Troy, 30.

1849.

May.—Minimum temperature at Fort Snelling, 24 degrees; St. Louis, 38; Pittsburg, 39; Sackett's Harbor, 37; Troy, 26.

September.—Minimum at Fort Snelling, 45 degrees; Detroit, 37; Pittsburg and Oswego, 41; Troy, 42; Harrisburg, 40; St. Louis, 46.

1850.

May.—Minimum temperature at Fort Snelling, 31 degrees; Green Bay, Wis., 30; Detroit, 29; Pittsburg, 32; Oswego, 36; Troy, 40.

September.—Minimum at Fort Snelling, 47 degrees; Pittsburg, 41; Oswego, 37; Troy, 46; St. Louis, 46; Newport, Ky., 48.

October.—Minimum at Fort Snelling, 31 degrees; St. Louis, 28; Detroit 25; Pittsburg and Oswego, 30; Troy, 26; Newport, 34.

1851.

May.—Minimum temperature at Fort Snelling, 29 degrees; Green Bay, 22; Detroit and Pittsburg, 28; St. Louis, 34; Newport, 31; Oswego, 33; Troy, 36.

September.—Minimum at Fort Snelling, 34 degrees; Green Bay, 31; St. Louis, 38; Pittsburg, 41; Oswego and Troy, 36.

1852.

May.—Minimum temperature at Fort Snelling, 33 degrees; Green Bay, 31; Pittsburg and Oswego, 36; Troy, 38.

September.—Minimum at Fort Snelling, 30 degrees; Harrisburg, 34; Pittsburg, 42; Oswego, 37; Troy, 42.

October.—Minimum at Fort Snelling, 30 degrees; Pittsburg, 34: Harrisburg, 29; Oswego, 30; Troy, 27.

1853.

May.—Minimum temperature at Fort Snelling, 33 degrees; Pittsburg, 34; Oswego and Troy, 30.

September.—Minimum at Fort Snelling, 41 degrees; Harrisburg, 34; Pittsburg, 40; Troy, 38; St. Louis, 42.

1854.

May.—Minimum temperature at Fort Snelling, 32 degrees; Pittsburg, 31; Troy, 30.

September.—Minimum at Fort Snelling, 39 degrees; Pittsburg and Harrisburg, 38; Troy, 40.

The following Record of Latest and Earliest Frosts at Fort Ridgeley, (Minnesota,) *as taken from the "Medical Statistics."*

1853,	Latest frost,	. . .	Earliest frost,	.	September 20th.
1854,	" "	May 11th, .	" " . .		October 4th.
1855,	" "	May 8th, . .	" " . .		September 27th.*

If the experience of past years were not in itself sufficient to set at rest any doubts which may have existed as to the sufficiency of the period of absence of frost for the full maturing of crops, this record is certainly valuable as showing that vegetation in Minnesota is, to say the least, no more liable to attacks of late and early frosts, than is that of other districts which are nearly coincident in mean spring and summer temperature.

It is often said, and has, in fact, become almost proverbial, that a greater

* The heavy frost of June, 1859, which was very destructive to wheat and corn in New York, Ohio, and Michigan, and that of September, killing corn and potatoes in Illinois and Wisconsin, were barely felt at Saint Paul. The first nipped the edge of the first leaf of the cucumber for a width of one-eighth of an inch. The latter killed the outer half of the leaves of the cucumber and squash, but did no injury to corn or tomatoes. The first *killing* frost occurred on the night of October 6th, at which date corn and potatoes were fully ripe, and the first nearly all harvested.

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degree of cold is required to produce a *frost* in Minnesota, than at the east. Frequently, on a cloudy day in spring or autumn, the sky is cleared at sunset, the temperature declines, the wind ceases, and a frost seems inevitable—but no frost occurs.

Occasional instances might be cited when the thermometer, indicating at or below freezing, vegetation has shown no signs of frost. This apparent paradox can only be accounted for by the absence of suspended moisture necessary to give the freezing temperature its *killing* properties. The soil of Minnesota—a black, sandy loam—absorbs the rains and heat with great avidity, while the heavy clays of many other districts are almost impervious to both, and the frost is terrible in its ravages, as is known, and sometimes even at a temperature some degrees above freezing.

Seasons of Drouth.—A *regular* periodic supply of moisture is another element of climate of the first importance in determining agricultural capacity. Any deficiency in humidity during the summer months is more injurious than a corresponding excess. Referring to the mean total fall of rain for the year, as given in the "Rain Table," it will be seen that it is less at Fort Snelling than at any other of the fifteen places, and only equal to two-thirds the mean of all. From this it might be inferred that Minnesota is subject to frequent and severe drouths, while the contrary is the case. No state in the Union has a more regular supply of summer rains. An examination of the succeeding table may be found interesting, as showing the fluctuations in the measure of summer moisture at various places in a long series of years.

Table of the fall of rain, at various places, during the summer of each year, for a term of years. Depth in inches and decimals of an inch.

Places.	1840	1841	1842	1843	1844	1845	1846	1847	1848	1849	1850
Fort Snelling, Min.,	9.8	*6.9	10.3	9.3	10.8	12.6	11.8	8.8	10.6	20.3	13.7
Prairie Du Chien Wis.,	12.4	13.8	14.5	9.4	18.8	10.7					
Portage City, Wis.,	12.9	12.9	10.4	6.4	14.6	10.0					
Sault St. Marie, Mich.,	9.7	5.6	7.6	6.1	11.5	9.7		11.0			15.2
Detroit, Mich.,	6.9	4.6	12.2	9.2	12.9	5.5				10.6	9.1
Pittsburg, Pa.,	9.1	10.7	14.9	8.0	10.9	10.8	17.2	12.8	9.0	7.4	6.7
Troy, N. Y.,	8.9	8.4	14.4	17.5		6.6	8.4	11.6	11.4		10.5
Houlton, Me.,	11.9	7.9	14.9	14.0	8.1	13.1					
Eastport, "		9.2	9.9	9.1	10,6	12.4				9.7	15.8
St. Louis, Mo.,		9.5		8.4	17.1	21.2	6.8	17.5	27.8	37.3	4.4

To compare the dry summer of 1852, at Fort Snelling, when the whole fall was 3.7† inches, with others, we have one at Leavenworth, Kanzas, in 1843, when the total fall was only 1.2 *inches;* at Harrisburg, Pa., 1849, 3.6 inches; at St. Louis, 1860, (as per table,) 4.4 inches; at Detroit, 1841, (as per table,) 4.6 inches; at Pittsburg, 1854, 4.6 inches; at Troy, N. Y., 1854, 4.7 inches. These facts, with those given in the table, show that Minnesota suffers as little, (if not less,) from interruptions or fluctuations of humidity as do the other northern states. This branch of our subject might be so extended as to include an investigation of the capability of the soil of Minnesota to endure the absence of surface moisture for long periods, but that hardly comes within the scope of this memoir.

Adaptation of Climate to the growth of Corn.—It is generally conceded that the climate of Minnesota is adapted to the perfect production of wheat, oats, barley, rye, and in fact all the grains and roots grown in the temperate latitudes, but doubts are expressed by many as to the sufficiency of the summer heat for the maturing of Indian corn. This is abundantly disproved by the experience of many years, as well as by preceding comparisons of mean temperatures and moisture,

* The next less fall and the least in nineteen years was in the summer of 1852—3.7 inches. This was without doubt local, as the record at Fort Ripley (120 miles, N. W.,) for the same season is 7.4 inches.

† Of this quantity 2.7 inches fell in the month of July, the fall in May preceding being unusually large, (4.7 inches,) and the intervening month, June, nearly dry.

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but a few extracts from "Blodgett," giving the northern limit of this grain and the districts where it may be produced in the highest perfection may not be uninteresting. Speaking of semi-tropical grains and fruits, he says: "The vigor given to vegetation in cold climates by the rapid increase in temperature is well known, and the peculiarity of the climate here, (in the United States,) is that this great stimulus is thrown upon tropical forms producing the highest measure of productiveness for this reason." * * * "The annual vines, as they are here called, melons, pumpkins and others, add a very decisive proof of the tropical heat of the American summer, and form a distinction when even the olive and orange fail. The country near Fort Snelling abounds in these more decisively than any part of the European shore of the Mediterranean, where even the orange and olive come to perfection and find a safe winter climate. The high brief heat which these require is as certain here at Fort Snelling and in Canada as at Naples and in Syria." * * * "In the climate of the Mississippi valley the high heat of midsummer and its sharp curve among the months brings the period of growth in the case of Indian corn down to *two and a half months at the fiftieth parallel*, a most extraordinary transformation of its natural habits and associations." * * * "The extreme limits of Indian corn northward are defined by the isothermal of 67° for July, and it may go a little beyond 65° for the summer, one month, however, being required at a higher mean than this. This limit goes from the *north shore of Lake Superior north-westward to Lake Winnipeg, at the meridian of Red river, continuing thence north-westward to the north branch of the Saskatchewan, if not to Athabasca river.*" * * * "The limit of profitable cultivation of this staple is a practical question which belongs to this consideration, and it is somewhat singular that *what may be designated as its decided success is so nearly coincident with the extremes of its possible limits.*" * * * "In New York, the southern New England states and Ohio, or from the forty-second to the forty-third parallels, the maximum of production of this staple is attained. Though the stem is less in size than farther south, there is a greater weight of it grown on equal areas, and the grain is in equal excess. A rich spot of land will show, in a favorable season, in these northern districts where the summer mean temperature is not above 68°, four or five times the quantity produced at the south where the mean is above 80°. In part this may be due to soil and to productive varieties, *but it is mainly due to the summer curve of temperature, the hasty growth, the excess of heat while it lasts and the hastened ripening period.*"

Mr. Blodgett here assigns to eastern areas, identified with Minnesota in mean summer heat, moisture, period of growth, and other climatic traits, the very foremost rank as corn-producing states, and there is no reason to doubt that the same attention given to the planting, cultivating and harvesting of this staple here as it receives there, will produce results equally large and, allowing for fertility of soil, very much greater than are there realized. In fact such has been the universal result from the beginning of its cultivation.

Winter Climate.—Many of the prevailing impressions concerning the winters of Minnesota, among those who have never experienced them, are founded in gross error. Notwithstanding the marvelous accounts of intense cold, with biting winds, and snows of untold depth, which have been disseminated, and have gained a great degree of credence at the east, the winter of Minnesota is the most healthful and invigorating of the seasons, and is to many the great charm of the year. The temperature of this season is a system of long and sustained curves, moving up and down with great regularity and precision, and, in a degree, this is a trait of the whole year. These oscillations occupy generally long periods of time, so that the transitions from one extreme to the other is made gradual and easy. Sudden changes in temperature, such as occur on the lake coasts and in the eastern states, are rarely if ever known. Here the waves of temperature, like those of a sea, move in long and measured swells—there, in the manner of a small lake or pool, they are more short, fitful and broken.

The popular idea of a Minnesota winter, at the east, (and it is to be regretted that it is mostly due to unwitting misrepresentations of residents of Minnesota themselves,) is that of a period of severe cold; monotonous, rigid, unvarying.

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The lowest known temperature is received as its measure, and it is at once pronounced *Arctic* and unfit for human habitation. How often do we hear the expression, "It never *thaws* here in *winter*," from the lips of a Minnesotian? It is time to correct this prevailing fallacy, for such a climate would indeed be *Arctic* and *insufferable*.

From observations by Messrs. Day & Jenks, druggists, of St. Paul, at the hours of 6, A. M., 1 to 2, P. M., and 6, P. M., commencing with December, 1855, the number of days on which the record was *at and above freezing*, is as follows:

Winter of	1855–6,	6 A. M.,	3 days.	2 P. M.,	19 days.	6 P. M.	8 days.
"	1856–7,	"	1 "	"	14 "	"	3 "
"	1857–8,	"	7 "	1 "	40 "	"	19 "
"	1858–9,	"	7 "	"	33 "	"	19 "
Means,		"	4½ "	"	26¼ "	"	12 "

The mean term for each year, registered at and above freezing, at 1 to 2, P. M., being 26¼ days, or nearly one-third of the season.

The following are the *means* of maximum and minimum temperatures and the range for the winter months at various places.

		January.			February.			December.		
		Max.	Min.	Range.	Max.	Min.	Range	Max.	Min.	Range.
Ft. Snelling, Min., mean of 33 yrs,		42	21*	63	46	19*	65	43	13*	56
Houlton, Me.,	" 17 "	45	17*	62	44	14*	58	42	9*	51
Montreal,	" 7 "	42	21*	63	46	17*	63	45	10*	55
Albany, N. Y.,	" 29 "	48	9*	57	48	5*	53	48	1*	49
Cincinnati, O.,	" 20 "	62	4	58	64	4	60	61	8	53
St. Louis, Mo.,	" 22 "	61	5	56	65	4	61	61	7	54

From which it will be seen that the average maximum temperatures of these months, at Fort Snelling, are from nine to twelve degrees above freezing. In this entire series of periods, embracing in the aggregate *ninety-nine* months, only *six* have maximum temperatures at or less than thirty-two degrees. The highest temperature recorded during the whole time is sixty degrees—the lowest, thirty-six degrees below zero. A comparison of range in temperature at these places shows but little difference in the means, if we except Albany. It must be borne in mind that the quantities here given are the average extremes of temperature for the *months*, and form no guide by which to ascertain the *daily* or *hourly* range, which is the true measure of sudden oscillations in temperature. A place having a monthly range of sixty degrees might experience changes in temperature of only a few hundred degrees during the month, while another having a less range might, by constant oscillations within this limit, measure its changes in temperature almost by thousands of degrees. It is to be regretted that no data are at hand from which to institute comparisons with respect to this important feature of climate.

Snows.—The fact that the eastern states which have low winter temperatures have also great falls of snow has induced another popular error relating to Minnesota winters. Reasoning from the cause, which is improperly considered as temperature, to the effect, snow, they fall blindly into the error of supposing that like results obtain elsewhere. An examination of the "Rain Table," conjointly with that of mean temperatures will at once show the absurdity of this hypothesis. It will be seen that Hanover, N. H., Houlton, Me., Montreal and Sault St. Marie are coincident with Fort Snelling in mean winter temperature. It will also appear by referring to the table of maximum and minimum temperatures for the winter months that those temperatures at Houlton and Montreal accord with those at Fort Snelling. Hence we must conclude that the precipitation at each of these places in the form of snow is in perfect proportion with the mean fall of moisture, and supposing this *all* to be snow, we have the following resulting depths, (considering the depths in the rain table as feet and decimals of a foot,) *viz.*: mean depth at Fort Snelling, 1.9 feet, Sault St. Marie, 5.2 feet, Montreal, 7.3 feet, Houlton, 7.5 feet; extreme depth at Fort Snelling, 3.6 feet, Sault St. Marie, 11.6 feet, Houlton, 10 feet.

* The * indicates below zero.

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But, it will be said, no such average or extreme depths of snow are ever known at the east; which brings us at once to the certain conclusion, that the snows of Minnesota are dissipated in the same degree, by the higher fluctuations in temperature, with those of places which are not only equal in *mean* but also in *maximum* and *minimum* winter temperature with Fort Snelling.

The average fall of snow, from "Blodgett," at several eastern places is:

At Oxford Co., Me., 12 years, 7.5 feet; At Worcester, Mass., 12 years, 4.6 feet;
At Dover, N. H., 10 years, 5.7 feet; At Montreal, 10 years, 5.6 feet;
At Burlington, Vt., 10 years, 7.0 feet;

and yet he says "the *elevated* and *northern* districts of New England have only an average of *two feet* constantly remaining on the ground in winter," or about one-third the average fall for the entire winter at the four localities in New England here cited. If we apply this ratio to the fall at Fort Snelling, the result is less than *eight inches* as the average quantity of snow lying on the ground for the whole winter, which may be safely assumed as correct in the absence of positive knowledge from observations. An interesting fact in this connection is the rapid decrease in winter precipitation north and west from Central Illinois. It will be seen by reference to the "rain table" that the mean fall at Athens, Ill., is 7.1 inches; at Prairie du Chien, Wis., 4 inches; at Portage City, Wis., 2.8 inches; while at Fort Snelling it falls to 1.9 inches.

The intenser periods of cold in the winter of Minnesota are very much modified and alleviated by the absence of winds. In fact the whole winter term is remarkable in this respect, as the following compilation from the "Register" indicates:

*Table showing the Mean Force of the Wind at various places during the months of January, February, March, and December, in each Year for a series of Years.**

PLACES.	1845 Mean Force	1846 Mean Force	1847 Mean Force	1848 Mean Force	1849 Mean Force	1850 Mean Force	1851 Mean Force	1852 Mean Force	1853 Mean Force	1854 Mean Force	Whole No. of Years.	Mean Force Whole term
Fort Snelling, Min., near St. Paul, . .	1.59	1.72	1.63	1.74	1.55	2.05	2.18	2.00	1.80	2.41	10	1.87
Fort Trumbull, New London, Conn., . .	2.53	2.85	. .	. .	3.41	2.98	2.31	2.45	2.16	. .	7	2.67
Fort Hamilton, New York City, ...	3.28	3.43	3.18	3.08	3.40	3.14	3.40	3 14	1.90	1.66	10	2.96
Fort Niagara, New York, ...	3.33	3 28	. .	. .	3.30	3.24	2.59	3.54	2.20	2.57	8	3.01
Plattsburg Barracks, Plattsburg, N. Y.,	2.58	1.69	. .	. .	. .	1.48	1.54	2.19	. .	. .	5	1.90
Fort Sullivan, Eastport, Maine, ...	3.29	. .	. .	. .	. .	2.31	2.37	2.55	2.63	. .	5	2.63
Fort Constitution, Portsmouth, N. H.,	2.44	. .	. .	. .	. .	2.18	2.53	2.70	2.65	. .	5	2.50
Alleghany Arsenal, Pittsburg, Pa., . .	2.13	1.85	2.08	1.86	2.08	2.29	2.15	2.74	2.31	2.55	10	2.20
Detroit Barracks, Detroit, Mich., ...	2.52	2.46	. .	. .	1.72	2.11	2.32	. .	. .	. .	5	2.26
Fort Atkinson, Winneshiek Co., Iowa,	2.88	2.07	. .	. .	. .	. .	. .	. .	. .	. .	2	2.48
Fort Leavenworth, Kansas, ...	2.30	2.19	1.70	1.99	2.55	1.45	1.61	2.08	2.07	2.30	10	2.09
Average force at all places, ...	2.63	2.40	2.15	2.17	2.57	2.32	2.30	2.59	2.22	2.30	. .	2.42

* In the classification of forces laid down in the "Register" 0 signifies a calm, 1 a barely perceptible breeze, 2 a gentle breeze, 3 a moderate breeze, 4 a brisk breeze, and so on to 10, which represents a violent hurricane.

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It appears that the mean force of the wind at Fort Snelling for the whole term is less than at any other station, and twenty-five per cent. less than the average of all stations for the whole term, and that the mean force in any year is below the average at all stations for the year, except in 1854, when it slightly exceeds the average.

As a consequence of this decreased action of the wind, the snows drift less than at the east and usually lie without material disturbance.

This fact, together with the lightness of the snow-fall, are remarkable traits of winter climate.

Synopsis of Climate.—Having now examined somewhat in detail and by comparison the laws of temperature, of the distribution of rain and prevailing winds in Minnesota, we proceed in conclusion to group together these elements of climate by months, giving a comprehensive view of the whole in a

Table of the Year.

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Mean Temperature—degrees,	13.7	17.6	31.4	46.3	59.0	68.4	73.4	70.1	58.9	47.1	31.7	16.9
Rain—inches,	0.7	0.5	1.3	2.1	3.2	3.6	4.1	3.2	3.3	1.4	1.3	0.7
Prevailing Winds—Courses,	N.E. to N.W.	N.W. to S.W.	N.W. to S.W.	N.W. to S.W.	S.E. to S.W.	S.E. to S.W.	S.E. to S.W.	S.E. to S.W.	S.E. to S.W.	S.	N. to N.W.	N.E. to N.W.

Is it possible to conceive a more perfect harmony between these three great fundamental conditions of climate than is here displayed?

Beginning with the first months of spring, the excessive rains of the Middle and Eastern States are here in a measure withheld; the frosts of winter are quickly dissipated by a marvelously rapid increase in temperature, and the ground is left ready for the plough. Now the season of labor begins. As the year advances and the seed-time has passed, the warm winds from the gulf increase. Copious rains descend and the rays of the sun as it approaches the northern tropic become almost vertical. All nature is once more animate and literally *bursts* upward in response to these genial influences. Midsummer is reached and with it the climax of heat and moisture is attained. Seas of golden grain are spread out to view where a few days before all waving green, and now on every side is heard the music of the reaper as it engirdles the mammoth field.

With the progress of the year the supply of heat and moisture slowly declines until the autumn harvest is closed. The autumnal equinox being passed and the season of vegetable growth ended, suddenly the fall of rain is arrested, "Indian Summer" is ushered in, and then follows the loveliest month of all the year.

Gradually and by equal degrees the decline goes on. One by one, lakes and streams, marshes and sloughs, are all converted into great natural roads, and the forest is made vocal with the sound of the axe and saw. The sleeping earth lies quiet and serene. The winds are hushed. From ten thousand house-tops the white smoke ascends in airy, inverted cones, whose bases dissolve away in the steel blue sky, and the sun rises bright and glorious, suffusing the wide landscape with an ephemeral but ineffable beauty.

Winter is passed; but not as in New England, in forcing breaches through huge banks of snow. Here, as a compensation for rigors of temperature, a wise Creator has reduced the measure of moisture to a snow-fall just adequate to the complete preservation of vegetable life.

Thus, as the seasons roll away, each in its turn adds new charms to those which have gone before, until the sum of the varied harmonies of a year is filled.

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CHAPTER III.

AGRICULTURAL PHYSICS.

1. Arable Areas.

Minnesota has a greater arable surface, in proportion to its whole area, than any state of the Union, and a greater absolute amount of surface available for agriculture, than any state in the Union.

(*a.*) *The Minnesota Adirondack.*—The district of country west of the wooded margin of Lake Superior, and north of the watershed, marked geologically by a substratum of the metamorphic rock, overlaid with drift, and embracing, with the mineral belt of the north shore, an area of about 15,000 square miles, must be mainly deducted from the area of profitable agriculture, and to this, although it contains tracts of considerable fertility, must, perhaps, be added the lacustrine summit level of the watershed, embracing an area of 6,000 square miles. 4,000 square miles of this district will be a generous concession to the account of sterile lands. This whole coniferous mountain tract west of Superior, which may be liberally defined on the south by the latitude of Crow Wing, and on the west by the Height of Land, which skirts the Itasca basin, and embracing an aggregate area of 21,000 square miles, has been well designated as the Adirondack of Minnesota, rich in valuable lumber and minerals, but unfitted, as a whole, to successful agriculture. The wooded declivity of the north shore of Lake Superior, with a length of one hundred and fifty and a breadth of about twenty miles, containing an area of 3,000 square miles, and the fertile tracts of the pine region, amounting probably to 2,000 square miles more, must be subtracted from the gross contents of this sterile district, giving a nett result of 16,000 square miles of land comparatively unfit for cultivation.

(*b.*) *The Agricultural District.*—The whole submontane basin of the Mississippi and Red river, distinctly separated from the uncultivable district by the line where the evergreen forests finally merge into the deciduous forms of forest growths, and containing an area in round numbers of 60,000 square miles, is covered throughout its whole extent with a fertile soil, producing all the cereals and roots of the temperate zone in great abundance. To the domain of profitable husbandry, Minnesota gives the following areas:—

Submontane basins of Mississippi and Red river, .	60,000	Square Miles.
North shore of Lake Superior, ...	3,000	" "
Fertile sections of coniferous region, ...	2,000	" "
Total, ...	65,000	

The agricultural surface of Minnesota is, therefore, equal of itself to a first class state, having a greater area than all New York, Pennsylvania or Wisconsin.

2. The Soils of Minnesota.

The prevailing soil of Minnesota is a dark, calcareous, sandy loam, containing a various intermixture of clay, abounding in mineral salts and in organic ingredients, derived from the accumulation of decomposed vegetable matter for long ages of growth and decay. The sand, of which silica is the base, forms a large proportion of this, as of all good soils. It plays an important part in the economy of growth, and is an essential constituent in the organism of all cereals. About 67 per cent. of the ash of the stems of wheat, corn, rye, barley, oats and sugar-cane, is pure silica, or flint. It is this which gives the glazed coating to the plants, and gives strength to the stalk. Now this silica is an acid, and, as found in some soils, is insoluble, and can not be appropriated for the use of the plant. But it readily combines with lime, soda, magnesia, potash, alumnia, iron and magnesia, forming silicates upon these alkalies, and in this condi-

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tion is readily available to the use of the plant, and forms an essential element in the growth of the cereals. When the sand exists, therefore, as free silica, as in the sand barrens of New Jersey, or the drift soils of upper Wisconsin, the soil is sterile. But when it exists in the form of silicates, in combination with the earthy alkalies, it forms a valuable constituent of a fertile soil. But another feature of the sands of the drift stratum of Minnesota is, that they are derived from fossiliferous rocks, abounding in the ancient remains of plants or animals, which probably will account for the fact that the poorest and lightest soils in Minnesota, possessing the least organic sediments, often exhibit a high degree of fertility. Furthermore, the predominance of sand in the structure of the soil of Minnesota, in attracting and disseminating the heat of the sun through its porous texture, is an important agent in the warmth of the soil.

According to the experiments of Professor Schubler, the following figures show the capacity of different earths to retain warmth, taking limestone sand at 100: limestone sand, 100; siliceous sand, 95.6; potters' clay, 76.9; pure grey clay, 66.7; ploughland loam, 70.1.

The superiority of sand in giving a high temperature to the soil, is a great advantage in a climate in which the limited period of vegetation requires the highest measures of heat.

Another important feature of the soil of Minnesota is, that its earthy materials are minutely pulverised, and the soil is every where light, mellow and spongy, existing naturally in the condition reached in soils less favorably constituted, by expensive under-drainage. With these uniform characteristics, the soils of Minnesota are of different grades of fertility, according to local situations, or the character of the underlying rocks from which their elements have been derived. Distributed according to geological situations, the soils of the agricultural district of Minnesota may be divided into limestone soils, drift soils, clay soils, and trap soils.

(1.) *The limestone soil* in which the calcareous element predominates, covers the magnesian limestone of the western slope of the Mississippi, occupying a width of from thirty to fifty miles, watered by the Root, Minneiska, Zumbro, Cannon, and Vermillion, and embraces portions of the counties of Washington and Ramsey, on the east side.

The land resting on this limestone is described by Owen, "usually of excellent quality, rich, as well in organic matter as in those mineral salts which give rapidity to the growth of plants, and that durability which enables it to attain a long succession of crops." An analysis by Dr. Owen, of the soil of this district, taken from the Eau Gallee, gave the following results:—

Analysis of soil of Limestone District of Minnesota, (Lower Mississippi Valley.)

Water,	2.50	Alkalies,	0.08
Organic matter,	8.20	Phosphates of lime and iron,	0.01
Silica acid,	0.04	Insoluble silicates,	77.01
Carbonate of lime,	0.80	Inorganic acids combined with	
Magnesia,	0.32	above bases and loss,	4.23
Oxide of iron,	2.68		
Alumnia,	4.04		100.00

The soil, illustrated by the above analysis, covers a district of about 5,000 square miles.

(2.) *The drift soil* of Minnesota, or the agricultural district resting immediately on the drift stratum, covers an area of 38,000 square miles, and embraces all that portion of the Mississippi and Minnesota valleys not included in the preceding division. Throughout the whole of that part of the district west of the Mississippi, the soil is a silici-calcareous loam, lying from one to two feet in depth, thinning on the ridges and deepening on the slopes, upon a various subsoil, irregularly distributed in sections of clay, marl or gravel. In all the valley bottoms, a deep alluvial soil prevails to the depth of from two to four feet. Though containing, perhaps, a somewhat larger proportion of sand than the limestone soil, it is nearly as calcareous as the latter, all its gravels and clays being highly calcareous, while in many parts it is even richer in organic and saline ingredients. Owen says the drift soils of Minnesota are "much superior to the drift soils of Wisconsin, the materials being more com-

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minuted and more generally intermixed with argillaceous, saline and calcareous ingredients." In fact, some of the richest agricultural sections of Minnesota, or of the west, occur in the drift stratum.

Of this character are the Blue Earth valley, the interior terraces of the Minnesota valley, the Crow and Sauk valleys, and the Otter Tail region, and the great argillaceous valley of the Red river, which belongs to a distinct division of the soils of Minnesota. All these valleys contain a deep vegetable mould. Through the Big Woods the soil rests generally on a clay subsoil.

We have three analyses of the soils of this district. The first is a sample of the soil of the Sauk valley, brought, we believe, from Lake Kandotta by E. Whitfield and declared to be an average specimen. It was analysed by Dr. A. H. Hayes, assayer to the state of Massachusetts, who makes the following statement of its composition:

Specimen No. 1, (*from the Sauk valley.*) "This was a dark colored, fine textured soil, abounding in organic matter and highly fertile. One hundred parts, in an air-dried state, afforded:

Moisture,	10.30
Humates, Crenates, &c.,	6.00
Sulphate of lime,	1.46
Carbonate of lime,	4.60
Silicates,	76.74
	99.10

Of the organic part of this soil six per cent. is composed of humates, crenates and gelatinous compounds of lime. It is in fact a large amount of natural manures mixed with soil, and can not fail to produce great and permanent fertility. It closely resembles the sugar cane soil of the West India islands." The above analysis shows that the soil described is even more calcareous than that of the limestone district, and much richer in organic sediments. In further proof of the calcareous nature of the drift districts might be mentioned the fact that the water is everywhere largely impregnated with lime.

Specimen No. 2, *from Red Rock prairie, Washington county. Analysis by Dr. B. F. Shumard.* This was a rich black soil.

Moisture,	5.10	Alumina,	3.50
Soluble organic matter,	8.80	Magnesia,	1.22
Insoluble organic matter,	5.80	Alkalies,	0.18
Silica,	69.40	Protoxide of iron,	3.40
Carbonate of lime,	2.00		100.00

The organic matter in this soil is as 14.60 to 8.20 in the limestone district; the lime is as 2 to 0.80, the alumina or clay basis as 3.50 to 4.04.

Specimen No. 3, *from Cottage Grove, Washington county.* The following is the result of an analysis of this specimen, by John P. Furber, of Cottage Grove, assisted by Prof. G. C. Swallow, at Hampden, Maine, 1850.

Water of absorption,	3.75	Phosphoric acid,	2.44
Organic matter,	9.50	Lime,	1.82
Insoluble soil,	76.47	Potash,	1.08
Protoxide of iron,	2.97	Soda,	0.66
Alumina,	1.31		100.00

The abundance of organic matter is the characteristic of this soil, and lime and potash exist in large quantities. These two last specimens are from the east side of the Mississippi, on the edge of the limestone district, and may be considered as, on the whole, too favorable illustrations of the soils on the east side. In this part of the district the country is characterized by frequent lakes, meadows, oak openings and swamps. A large part of the soil is good, but often thins into a loose, irretentive sandy loam on the ridges. It is generally deficient in clay, but this is to some extent compensated by its richness in organic sediments.

(3.) *Trap Soils of St. Croix Valley.*—Near Taylor's falls and on the Kettle and Snake rivers in Chisago and Pine counties, where the hypogenous rocks obtrude, districts of rich trap soil occur, supporting a heavy growth of sugar

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maple, oak, &c. This soil exists in local sections. We have no means of computing its area.

Argillaceous Soil of Red River Valley.—This is an alluvial, black, argillaceous mould, rich in organic deposits, and resting for a depth of from two to four feet on a tenacious clay subsoil. It is the best soil in the north-west; wheat in this soil produces an average of forty bushels to the acre. The Red river valley in Minnesota has an area of 17,000 square miles, the lower portion of the slope only being known to sustain this soil. The soil of the Otter Tail lake region is a rich sandy loam. Of its character in other parts of the eastern rim of the valley nothing is known, except that on the borders of Red lake thriving farms have been maintained by the missionaries.

3. Soils of the Coniferous Region.

(1.) *The Watershed.*—Although a great portion of this country is occupied by swamps and sandy drift knolls, it can not be subtracted from the agricultural district of the state without liberal local exceptions. A great deal of the soil is of rich lacustrine alluvial deposits; the bottoms are deeply alluvial, supporting a heavy growth of timber. Among the lakes are intermediate tracts of great fertility. The sandy soil of the uplands is highly impregnated with lime, and when the calcareous clay which underlies it approaches the surface, it forms a strong, rich soil. It is a sufficient indication of the agricultural capacity of considerable portions of this district that corn, which can not be cultivated at Sault St. Marie, is annually raised by the Indians at the sources of the Mississippi. The abundance of the rice plant and cranberry redeems the marshes which they cover. Dr. Norwood of Owen's Geological corps thus estimates the value of this region:

"In this connection, it may not be out of place to remark that, so far as the mere support of life is concerned, taking into account the amount of labor required to do it, this region is equal, if not superior, to any of the settled states. The rice fields, which require neither sowing nor cultivating, only harvesting, yield all that is essential for bread stuffs; but in addition to this, corn can be cultivated with as little or less labor than in the middle states. Potatoes, far superior in size and flavor to any I have ever seen in the Ohio valley, are grown with little attention, and turnips and beets produce abundantly. Extensive natural meadows border the lakes and streams, the luxuriant grasses of which are sweet and nutritious, and eagerly eaten by cattle; while the streams and almost innumerable lakes abound with a great variety of fish of the first quality, and which may be taken at all seasons with little trouble. The uplands are generally covered with a good growth of both hard and soft woods, sufficient for all the wants of man. The sugar maple is abundant, sufficiently so to yield a supply of sugar for a large population. In addition to all this, the forests are stocked with game, and the lakes and rice fields must always, as they do now, attract innumerable flocks of water fowl."

The available soils of this district are estimated to occupy an area of 2,000 square miles, and this area is being constantly extended by a natural process of drainage which is gradually turning the alluvial marshes into dry land.

(2.) *The Superior Basin.*—The Superior country supports four principal varieties of soil. A drift soil which prevails over the hilly ranges between St. Louis river and the lake, thin, sandy and sterile; a red clay and marly soil, generally wet but rich and retentive, supporting a dense growth of cedar, balsam, spruce, birch, &c., capable of profitable cultivation, extending up some of the valleys and slopes on the shore of the lake, and the Rainy lake district described above; a trap soil of limited extent on the high ridges and slopes near the shore, supporting a heavy growth of sugar maple, oak, &c., and the alluvial bottoms which line some of the rivers. The trappean slope of the Superior basin, lying immediately on the north shore, and embracing a width of twenty miles, with a length of one hundred and fifty miles, and an area of 3,000 square miles, with its rich trap soil and its sunny southern exposure, embraces nearly all the agricultural lands in this district. This soil, the cultivation of which is impeded by its heavy forest growth, is exceedingly prolific of

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potatoes, turnips and garden roots, and doubtless, unless restricted by climatic causes, of the cereals also.

4. Agricultural Capacity of the Climate.

(1.) *Measures of Temperature.*—Referring to the able paper furnished for this volume by D. C. Shephard, Esq., upon the climatology of Minnesota, we find the following conclusions, established by a long series of meteorological observations at Fort Snelling and other military posts:

First.—That the *annual* mean temperature of St. Paul, (44 3-5 degrees,) coincides with that of central Wisconsin, central New York and southern New Hampshire, 2 degrees south of it.

Second.—That its spring temperature, (45.6 degrees,) is the same as that of central Wisconsin, northern Illinois, northern Ohio, central and southern Pennsylvania and New Jersey, 2½ degrees south of it.

Third.—That its summer temperature, (70.6 degrees,) is the same as that of middle Illinois and Ohio, southern Pennsylvania, Long Island and New Jersey, 5 degrees south of it.

Fourth.—That its autumn temperature, (45.9 degrees,) is the equivalent of northern New York, 1½ degrees south of it.

Fifth.—That its winters, (16.1 degrees,) are the same as middle New Hampshire and Lower Canada, upon the same parallels.

(2.) *Moisture.*—By referring to the rain tables in Mr. Shephard's article it will be seen that the *annual* mean fall of rain, or of snow reduced to water, in Minnesota, is less than in any of the states east of the Mississippi. The rain tables in the article on climatology give the results of observations at Fort Snelling only, but the rain charts of Blodgett show that over all the north-eastern part of the state represented by the hyetal tables of Fort Ripley, the rain fall is deepened by its proximity to Lake Superior, and perhaps by the influence of the northern lake country.

The following from Blodgett's tables shows the rain fall at the two places, with the mean for Minnesota.

	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	October.	Novem'r.	Decem'r.	Spring.	Summer.	Autumn.	Winter.	Year.
Fort Snelling,	0.73	0.52	1.30	2.14	3.17	3.63	4.11	3.18	3.32	1.35	1.31	0.67	6.61	10.92	5.98	1.92	25.43
Fort Ripley,	0.86	0.37	1.80	1.42	3.09	5.15	5.00	2.49	4.93	1.10	2.16	0.79	6.31	12.64	8.19	2.02	29.16
Mean for Minnes'a,	0.79	0.44	1.55	1.78	3.13	4.39	4.55	2.83	4.12	1.22	1.73	.73	6.46	11.78	7.08	1.97	27.29

We have given the monthly precipitation in order still further to illustrate the observation of Mr. Shephard, as to the rapid accumulation of moisture in the season of growth, and, commencing at the season of germination, and culminating in the month of fructification, its rapid decline in the golden days of autumn, and the extreme dryness of the serene midwinter months of December and January.

By comparing the means for Minnesota with those tabulated by Mr. Shephard for other places, in the same climatic zone, and with other portions of the Union represented in the official tables, it will be seen,

1. That Minnesota enjoys a far dryer winter than any state in the Union.

The winter fall of Minnesota being	1.97 inches.
Of Wisconsin and Iowa, ...	8 "
Of Michigan, Canada, and northern belt of the New England and Middle States, ...	7 "
Of States on the seaboard, ...	10 "
On the Gulf, ...	12 to 15 "
On the Pacific coast, ...	10 to 30 "

2. That the springs of Minnesota have an adequate supply of moisture for the germinal processes of vegetation, without the excessive humidity which interrupts the labors of the husbandman in other states.

The spring fall of Minnesota being.	6.46 inches.
Of northern Wisconsin, Michigan and Lower Canada, .	6. "
Of the remaining middle, northern and western states,	8 to 10. "

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3. That the fall of rain during the summer months or season of growth is equal to that of any of the states, and exceeding that of many of the best agricultural districts.

The summer precipitation for Minnesota, being	12 inches.
In eastern Wisconsin and Illinois, in Michigan and Canada, Vermont, Maine, eastern Massachusetts, Connecticut and New York, ...	10 inches.
In Pennsylvania and Ohio, ...	10 to 12 "
In remaining north-western, middle and north-eastern states,	12 "
In California, ...	00
In Oregon, ...	2 to 3 "

The summer rains of Minnesota are 43 per cent. of the yearly quantity. In the states east of the Mississippi, the summer fall is from 25 to 36 per cent. of the yearly quantity. The abundance of summer rains in Minnesota is doubtless properly attributed by Prof. Maury to its characteristic lake system. "The concurrence of this tropical exuberance of moisture, with the season of vegetation, is a distinguishing trait of the climate, and is one of the causes of the marvelous rapidity and luxuriant splendor of the summer vegetation.

(3.) *Comparative Exemption from Drouth.*—By referring again to Mr. Shephard's tables, illustrative of the liability of different representative localities to drouth, it will be observed that Minnesota is as little liable to this contingency as any of the northern inland states, the summer measures for nineteen years never falling but once to a mean for the two forts of Ripley and Snelling, of five and a half inches, while Michigan shows at one time four and a half inches, Kansas, 1 2-10ths inches, Pennsylvania, 3.6 inches at Harrisburg and 4.6 at Pittsburg, and Troy, N. Y., 4.7 inches, and all these localities are liable to extreme fluctuations in the rain fall, from which Minnesota is preserved by the abundance of its inland waters, which afford a permanent system of reservoirs for the distillation of summer rains.

(4.) *Comparative Exemption from Frosts.*—The liability to disastrous frosts in the season of growth, which characterizes most parts of the temperate zone, is a climatic incident which more intimately concerns the interests of husbandry than any other of the occasional phenomena of agricultural meteorology. As the means of heat in the official tables are only given for months, it is, of course, impossible with such data, to fix the precise limits of the period of exemption from frosts in this or other states. Even a register of the daily extremes of temperature would fail to furnish an absolute index of the occurrence of frosts. For it is a fact well established by experience, in the climate of Minnesota, that the *temperature may fall considerably below freezing point without producing frost.* We are glad to be able to present the following paper from Dr. C. L. Anderson, of Minneapolis, on the philosophy of this remarkable exemption from frost.

(5.) *Causes of the Exemption from Destructive Frosts in Minnesota.*

Table showing the daily means at different places for the first eleven days of May, 1857.

May, 1857.	45° 30′ Montreal, Canada.	43° 10′ Rochester, N. Y.,	42° 45′ Platteville, Wis.	37° 48′ San Francisco, Cal.	45° St. Anthony Falls, Minn.
1	28	25	39	56	45
2	27	50	47	60	52
3	43	44	56	63	63
4	47	42	61	59	54
5	49	50	54	57	53
6	41	43	58	56	56
7	45	51	59	57	56
8	53	54	65	62	70
9	62	70	51	60	44
10	50	45	42	59	35
11	36	38	44	57	51

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Remarks.—We select, from the foregoing table, the first eleven days of May, 1857, as an example of the thermometrical conditions of our climate, in comparison with other places on the American continent. We select this period because it appears to have been about an average season; and hence it shows what may usually be expected. About the 10th of May, in the northern states, is a period very subject to slight frosts. Most of the injuries to spring crops result at this early period. It is, therefore, important to the agriculturist, and a brief comparison with other localities between the latitudes of 37° and 46° north, will show that Minnesota does not suffer in the comparison. For instance, from the 3d of May, 1857, to the 8th of the same month inclusive, we enjoyed, at St. Anthony Falls, a temperature almost of the same degree with San Francisco; on the 3d, 63° was noted in both places as the average, and until the 8th there was no perceptible difference, at which time our temperature went up to a mean of 70°; that of San Francisco remaining at 62°. At Montreal, from the 3d to the 8th, the temperature was from 41° to 53°, the mean for six days being about 46°. At Rochester, there was but little difference from Montreal, the mean for six days being about 47°. At Platteville, San Francisco, and St. Anthony Falls, the mean for these six days, in even numbers, was 59°, (a slight fraction higher at the first two places, than the last one.)

But on the 9th there began to be a change. The mercury fell at St. Anthony Falls to 44°, and on the 10th, to 35° average. At Platteville the change was not quite as sudden, and at San Francisco it was scarcely felt. At Montreal and Rochester, 36 and 38° were, respectively, the means on the 11th.

At the same time there were slight frosts throughout the northern states, and in many places vegetation was severely injured. There were frosts in Minnesota, in nearly all low grounds. The injury, however, was scarcely noticeable. The *dryness of the atmosphere*, which is a peculiarity of this region, allows a much lower range of temperature without injury to vegetation, than in moister climates. I have noticed the thermometer at 20 degrees in May, without material injury to vegetation.

There are several facts which account for this impunity of vegetation to low temperatures in our state. 1. Taking the table as an example: On the 8th, at Montreal, 53° was the temperature, 54° at Rochester, 65° at Platteville, and 62° at San Francisco, whilst at St. Anthony Falls it was 70°. With a long day, and a temperature at 70°, the earth becomes well warmed. The light has given, in addition to the heat, great vigor to the plants. They grow rapidly, but with firm texture. They are consequently able to resist much cold on account of their excessive vitality, the same as a person who has dined heartily on rich food, is better able to bear the cold of winter. 2. A sudden change of temperature, as is the usual case in Minnesota, one extreme following another in rapid succession, is less deleterious to vigorous plants than a gradual lowering of temperature. The earth and plants still retain the heat previously absorbed, and are thus enabled to bear an atmosphere at 20° much better than one at 35°, after their latent heat has been given off. 3. The dryness of the atmosphere which I have already mentioned. This is accounted for from the fact that the moisture conveyed in the air has a tendency to *soften* the delicate covering of plants, and thus render them more sensitive to cold. This may be easily explained by a little experiment with a person's hands on a cold day. Keep one dry, and slightly moisten the other, and you will soon observe which suffers most with cold. 4. The heat-retaining character of our soil. Being composed mostly of silex and clay, when once warmed it requires a long cold spell to abstract that heat. This accounts for the long season of warm days in autumn, called "Indian summer."

For these reasons, and several others that might be mentioned, the climate of Minnesota is less subject to killing frosts than might at first be supposed, on account of its high latitude.

It may not be out of place to refer to the amount of sunlight received here during our growing season. Whilst at New Orleans, in July, they are having fourteen hours sunlight, we, of Minnesota, are having sixteen hours, with much longer twilights than they have. Consequently our vegetation grows more rapidly than theirs, and matures much sooner. This is a beautiful law of compensation. What we lack in heat is made up in sunlight, during our summers.

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In conclusion, I will hint at a prevalent opinion in regard to "sudden changes" in Minnesota. Some persons have, in their zeal for our climate, contended that sudden changes are rare, and of no great violence. This is a mistake. Thermometrical, barometrical, and hydrometrical changes are sudden, violent, and not very rare. We are half-way between the equator and the north pole, and subject to either extreme. This, instead of being a disadvantage, is rather in our favor. It gives variety, a thing very desirable at times. Then again, these changes are, for the reasons already given, seldom pernicious. Plants and animals are armed with the proper implements for resistance, dryness of the air, the heat-retaining character of the soil, the compensatory powers of nature, the tonicity of air, being pure and free from miasma. I would not infer that we are subject to hurricanes, or other violent commotions of the atmosphere, any more, or as much as other places. But we have a touch, at times, of both extremes, a vibratory movement of the climates of the torrid and frigid zones, alternately. In summer the thermometer occasionally indicates 100 degrees, in winter, once in a great while, the mercury freezes. Rains, hail, and snow, alternating with the soft and sometimes sultry breezes of the south. There is great variety of climate in Minnesota. Yet there is no place south of our state, where crops are surer, or where the quality of vegetables is better, as has already been proven by a sufficient number of years' experience.

(6.) *Period of Total Exemption from Frosts.*—Until a better system of registration furnishes us with the definite law of frosts, we must be content with such meager facts as we have been able to collect as to the exact limits of the period of exemption from frosts. The following records of the earliest and latest frosts for several years are all which could be obtained.

(1.) *Frost Record of Fort Ridgley.*

	Latest Spring frost.	Earliest Fall frost.	No. of days exempt from frost.
1853,	———	Sept. 20th.	
1854,	May 11th.	Oct. 4th.	146
1855,	May 8th.	Sept. 27th.	142

(2.) *Frost Record, by Thomas Ford, of Freeborn Lake, Freeborn Co.*

	Latest Spring frost.	Temperature at sunrise.	Earliest Fall frost.	Temperature at sunrise.	No. of days without frost.
1857,			Sept. 30th.		
1858,	May 20th.	28°	" 9th.	33°	112
1859,	" 13th.	28°			
	June 4th.	38°	" 2d.	32°	91

The mean for the four years of which the record is complete in the above tables, *is one hundred and twenty-five days of total exemption from frost.* It will be seen, moreover, that the last season was curtailed by frosts at both its extremities to a period far shorter than the average. It is but just to add the remark of Mr. Ford, upon the record furnished by him, that none of the frosts mentioned were severe enough to injure vegetation at all seriously in his locality, as a glance at the accompanying notes of temperatures, taken at the coldest extreme of the day when the frost occurred, conclusively proves, but which does not appear in its full effect without taking into account the remarkable power of resistance to frosts exhibited by vegetation in Minnesota, and which has been well discussed by Dr. Anderson in the preceding section.

(7.) *The Range and Effects of the Frosts of* 1859.—In the table appended, the effects of the frosts and other casualties of the season of vegetation are exhibited in the several counties of this state. The frost of June 4th and 5th, the last of the spring, it will be seen, fell lightly on the vegetation of Minnesota everywhere, and did no permanent injury to field crops of any kind. The frosts of the first days, from the 1st to the 8th, struck very unequally over the state, as to the precise dates of its occurrence. The thermometrical record for those days shows an unusually low temperature for the whole period, and a slight assistance from local causes would have generated frost anywhere. The soils most capable of retaining heat would be the least likely, as well as the last, to be affected.

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Accordingly we find the first frosts of September 1st, 2nd and 3d, fell most heavily on the most southern and south-western counties, where from one-quarter to three-quarters of the corn crop was cut off. While in Hennepin county the frost did not occur till the 3d or 4th, and then with very slight injury. In the siliceous soils of the north-eastern counties no frosts whatever were noticed, in Anoka or Benton counties, and very slightly in Morrison. In Ramsey and Washington counties no frost was noticed on the higher lands till Oct. 10th. In fact the high open prairies all over the state were remarkably free from frost, while the contiguous lowlands, or the vicinity of creeks or swamps, suffered severely.

(8.) *Effect of Lakes in warding off Frost.*—A remarkable fact in this connection, developed by specific inquiry, is that in every instance the immediate vicinity of lakes was exempt from frosts from a week to ten days earlier in spring, and for the same time later in fall than the other localities. This sheltering influence extends for half a mile or a mile around lakes of only two or three miles diameter, and probably over a much wider distance around larger bodies of water. This fact would seem to indicate that the large lake surface of Minnesota exercises an important influence in restricting the oscillations, at least, of its summer temperature, and should perhaps be added to the causes of its peculiar exemption from disastrous frosts, which are given by Dr. Anderson, in a preceding page.

(9.) *The Range and Comparative Effects of the Frosts of* 1859 *in other States.*—The frost of June 4th especially had a wide and destructive range. It is noticeable as a proof of the comparative exemption of this climate from disastrous frosts, that while it did no damage to field crops in Minnesota, its effects in Illinois, Indiana, and especially in Ohio, were almost universally disastrous. We have before us only the record of Ohio and that shows a *continuous series* of *killing frosts for every month in the year.* On the 4th of June, in several places in Ohio, ice was formed a third of an inch thick. On the 4th and 5th of July, on the 29th of August and on the 1st, 4th and 5th of September, disastrous frosts occurred. In Minnesota there was not the slightest tendency to frost from June 5th to September. The first did no injury, and the second was only locally destructive in the southern districts of the state.

(10.) *Summary of Agricultural Capabilities.*—A spring temperature of 45.6 degrees, measuring eighty days of germinal vegetation; a summer temperature of 70.6 degrees, measuring one hundred and twenty-five days of growth and fructification, without frost; a spring rain-fall of 6-46 inches, and a summer fall of 11.78 inches; such are the elements of the climatological capacity of Minnesota for agricultural production. The equivalent in spring and summer temperature and in summer moisture of middle Illinois, Ohio and southern Pennsylvania, with a longer period of reliable exemption from frosts, with a soil at least equal to either in average productiveness, its agricultural rank is sufficiently determined in general terms by its equality with those first-rate states in the essential conditions of agricultural success. But the statistical elements above given enable us to determine the exact degree of the agricultural capacity of the climate.

(*a.*) *Thermal Capacity for Corn.*—According to Blodgett there is required for the successful cultivation of Indian corn, "a mean temperature of 67 degrees for July, and it may go a little beyond 65 for the summer."

The mean temperature of Minnesota, for July, is	73.4
Required for corn, ...	67.0
Excess, ...	6.4
Mean temperature for the summer, is	70.6
Required for corn, ...	65.0
Excess, ...	5.6

So that Minnesota has an excess of 6.4 for July and of 5.6 for the summer, over the measures of heat required for corn, being exactly the same in this respect as the great corn-growing districts of southern Ohio and Pennsylvania. This

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wide margin above the required temperatures fully demonstrates the capacity of the climate for corn, and the *a priori* inference is confirmed by experience, which shows an actual average productiveness of about thirty-five bushels to the acre. The severe damage done the corn crop of 1859, by the frosts of September, reducing the yield in many localities to less than ten bushels per acre, though an isolated and exceptional incident, seems to indicate, nevertheless, an element of uncertainty in the corn crop of Minnesota, from which all other crops are exempt.

(*b.*) *Thermal Capacity for Wheat.*—Wheat, to be a successful crop, requires a mean temperature of from 62 to 65 degrees for the two months of July and August.

These two months, in Minnesota, have a mean temperature of	71.8 degrees.
Wheat requires, ...	65 "
Excess, ...	6.8 "

It is not surprising that, with this wide margin of summer heat, Minnesota should produce superior crops of wheat.

5. Actual Productiveness.

Grains.—We are now prepared to turn to the experimental proofs of the agricultural capacity of the soil and climate of Minnesota. From the data collected by an assiduous canvass of the state during the winter, by circulars addressed through the Boards of Supervisors to several hundred townships, the following approximate estimates have been deduced of the average yields of the grain crops:

Wheat, . . .	20 bushels per acre.
Corn, . . .	35 " "
Oats, . . .	40 " "

Fruits.—The range of agricultural production, however, is limited by the tropical measures of the spring and summer heats. All the annual forms of vegetation which perfect in a single season grow in this climate in tropical luxuriance, but the extreme cold of recent winters has not proved favorable to the growth of fruit trees, and the opinion has sprung up that the climate is unsuited to their culture—an extraordinary inference, when we consider that many forms of wild fruit are indigenous to the country.

The wild plum grows in profusion throughout the Minnesota Valley; the crab-apple is found in localities, and the native grape-vine attains an extraordinary luxuriance and fills the wooded bottoms of the rivers. We have not, however, been able to obtain any statistics of the results of fruit culture upon which to base any authoritative deductions. It is established, however, that the more hardy varieties of apples succeed well.

It is probable that a more careful attention than has hitherto been bestowed upon the acclimatization of this tree will yield better results. It must be recollected also that the experiments in fruits have only been conducted within the last six or seven years, and that within that time some of the best fruit districts of the northern states have met with such continued ill-success that in many parts of the Eastern and Middle states it has become a serious question whether it might not be desirable to abandon any further attempts at raising apples or peaches, and cut down orchards that only serve to cumber the ground. The report of the Commissioner of Statistics of Ohio, alluding to the former abundance of Ohio apples says:

"Now the case is different. Either from neglect in planting orchards or from *the bad seasons of the last three or four years*, few Ohio apples now appear in market."

A correspondent quoted by the commissioner says:

"The old orchards of our county appear to be dying out, it is thought, and I believe the cause is mainly from the *hard freezing during two or three of the last winters.*"

"This remark," says the commissioner, "is probably correct, and will apply to many other counties in the state. The amount of destruction to fruit trees by the two cold winters we can scarcely appreciate."

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These quotations are sufficient to show that the destruction of apple trees in Minnesota was not owing to any local peculiarity of the climate, but that the best apple states suffered equally from the same general causes.

The following facts in relation to apple-growing are condensed from the report of the Legislative Agricultural Club held in the winter of 1859–60:

Mr. Ford, of Ramsey County, commenced the growing of fruit trees in 1850, and afterwards imported trees from Iowa, Illinois, and New York. *Trees seemed to do well until the hard winters of* 1855–6, when a large number of trees were killed, including apple, pear, plum, and cherry. Out of one hundred kinds of apples fifteen or twenty kinds were little injured. In the following winter, which destroyed an immense amount of fruit trees in Illinois and Ohio, these again escaped. In the mild winter of 1858–9 more than half these were killed.

Rev. Mr. Pond, of Oak Grove, who has lived in this state a good many years, has successfully raised apple trees that bore fruit year after year. Mr. Furber, of Cottage Grove, planted seeds several years since, and in six years had pies made from apples grown on them.

A Mr. Kimball, of Dayton, on the Crow River above St. Anthony, had set out four hundred apple trees. A large proportion had withstood the rigors of winter and were now in a very thrifty condition—in two years would have fruit in abundance.

Mr. Clarke, of Ramsey County, imported trees from Ohio in 1854 and lost them all. Two years ago he imported twenty-two trees from Buffalo, selected to suit the climate; twenty of the twenty-two are now doing well. Apples were reported as growing in different parts of the state, generally on heavy clay subsoils. Sandy loam, without a rooting of clay, pushes ahead the growth too rapidly. The frosts find the tree in an unripe condition, and it dies of its own luxuriance. All the experience reported at the Club pointed to the necessity of protection for the young fruit trees from the north winds. Orchards sheltered by timber had nearly uniformly succeeded. Plums, pears, and cherries thrive well on similar conditions.

Wild Fruits.—The *wild plum*, which grows in little groves on the borders of marshes or streams, abounds in many localities and makes a favorite preserve. A large kind is yellow-fleshed and approximates to the peach.

Gooseberries, blackberries, black currants, marsh cranberries, and both red and black raspberries abound in the woodland.

The crab-apple is found very frequently in the prairies.

Strawberries grow every where in the wild sod of the prairie.

The wild grape attains an extraordinary luxuriance in the wooded bottoms throughout the state.

Comparison of Yield of Corn with other States.—If the average product of Indian corn is not overrated in the reports we have received from localities which were exempted from the severe frost of September 3d, the average yield per acre is from thirty-five to forty bushels. The following table will exhibit the comparison of this product with that of the seats of the maximum production of this staple, as given in De Bow's Compendium of the United States Census:

Minnesota,	35	bushels per acre.
Illinois,	29	" "
Iowa,	32	" "
Missouri,	34	" "
Ohio,	36	" "

Comparison of Wheat Yield with other States.—If the average yield of wheat per acre in the crop of 1859 may be regarded as the standard of its production, twenty bushels per acre must be assumed as the measure of the wheat yield of Minnesota. Compared with the most prolific wheat districts of the Union, the following table shows the decided superiority of Minnesota as a wheat-producing state over the best wheat states:

Minnesota,	20	bushels per acre.
Illinois,	11	" "
Iowa,	14	" "
Michigan,	10	" "
New York,	12	" "
Pennsylvania,	15	" "

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The Minnesota yield relates to spring wheat alone. Winter wheat has not been cultivated to any extent.

6. Decisive Culmination of Wheat Growth in Minnesota and the Red River Valley.

This comparative affluence of the wheat product of Minnesota affords a decisive illustration of the remarkable law already noticed in connection with the great wheat districts north of Minnesota, as governing the distribution of commercial plants, to wit: that these plants yield the greatest products near the northernmost limits in which they will grow.

The product of Indian corn, the standard of which is less confidently deduced from the agricultural experience of the state, may be considered as a less emphatic instance of the same fact in the distribution of the cultivated plants.

But the wheat yield, even though regarded as the effect of an unusually favorable season, establishes the marked prominence of Minnesota among the best wheat districts of the continent, and, with the still more prolific yields of the Red River Valley, indicates a remarkable culmination of the wheat product in the new areas of the north-west.

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CHAPTER IV.

AGRICULTURAL ECONOMY.

1. Growing Importance of Wheat as an Agricultural Staple.

These facts in relation to the tendencies of wheat culture in connection with the phase which the bread question is rapidly assuming throughout the world, are of immense importance in its economical bearing upon the future of Minnesota. Heretofore corn has been the leading staple of American agriculture, and in 1850 the value of the corn produced was nearly three times that of the wheat, and the breadth of land in corn had nearly the same proportion, as follows:

	Corn.	Wheat.
Area tilled,	31,000,000	11,000,000
Value,	296,035,552	100,485,944

But the rapidly-growing disproportion between the food resources of the eastern continent and the demands of the increasing population, promises to invest the wheat districts of North America with a value that never belonged to them before. Consumption has already overtaken production in the manufacturing states of Europe, and everywhere the increase of population is pressing upon the supply of food. In 1756, according to M. D. Angueville, "England could grow corn enough in one year to supply herself for four," and now this same England, despite the improved cultivation in which she leads the world, is said to import food annually to the amount of $225,000,000 in corn, wheat, barley, oats, beans, meal and flour, and her population is increasing at the rate of one thousand a day. Yet since D'Angueville wrote, England is estimated to have three times the amount of land under cultivation, while the ratio of her crops has doubled if not trebled. Throughout France, Prussia, Austria, Belgium, Holland and most of the German states, the increase of population is attended with a decrease in the breadth of land devoted to cereal produce. Throughout all Europe except Russia, an inevitable and increasing demand for food, with an insufficient and diminishing home supply, is forcing European states to look to the United States and Russia for their supply of food. "One fact," says the Mark Lane Gazette, "is clear, that it is to western America that we must in future look for the largest amount of cereal produce." In accordance with this increasing foreign demand, the breadstuffs and provisions exported from the United States averaged *per annum* for the period from 1830 to 1840, $12,000,000; 1840 to 1850, $27,000,000; 1850 to 1860, $52,000,000.

2. Startling Decline of Wheat Culture in the United States.

With the rapidly-increasing foreign demand for American breadstuffs, and increasing exports of wheat, the statistics of American agriculture reveal the startling fact of a rapid and constant decline in wheat culture relatively to the increase of population throughout the Union. For instance, in 1840, the United States produced 84,823,272 bushels of wheat. If agriculture had remained simply stationary, considering the increase of population, the product of 1850 should have been 115,240,000, instead of which it was only 100,485,944 bushels; that is to say, that in 1840 the product was nearly five bushels for each individual of the whole population, while in 1850 it was but four and one-third bushels. Now the standard of consumption of wheat in England is six bushels to each inhabitant, and from the substitute of corn, five bushels per capita in the United States. In 1850 the United States required, therefore, for home consumption, 115,959,380 bushels; it produced but 100,485,944, of which it exported, 11,038,390, leaving but 89,347,554 bushels for home consumption, a deficit in the home

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supply of 26,571,326 bushels. The whole average wheat crop now is estimated by an eminent statistician at 126,000,000, of which we export about 11,000,000. Now the population is about 28,000,000, requiring 140,000,000 bushels of wheat, leaving a deficit annually of 25,000,000 below our actual wants.

The local statistics of the wheat crops of 1850 and 1840 show that this diminution has taken place chiefly in the southern and eastern states, which show not only a relative but actual decrease, while the increase in the northern and western districts has not sufficed to overcome the relative decrease of the whole product.

3. Decrease of Wheat Product of Southern States.

The absolute decrease may be thus shown: In 1840 the states south of latitude 40° and the Ohio river produced 30,933,701 bushels, being thirty-six per cent. of the whole product of the United States. In 1850 the same states yielded only 29,448,793 bushels, or twenty-nine per cent. of the whole national product. The relative decrease will be illustrated by the fact that in 1840 the wheat product of this district was as six bushels to one inhabitant, and in 1850 less than three bushels to one inhabitant.

4. Decrease of Wheat Product of New England.

In 1840 the six New England states yielded 2,024,100 bushels of wheat, or twenty-four per cent. of whole product of the Union, being nearly one bushel to each inhabitant of New England; in 1850 only 1,090,894 bushels, or one per cent. of whole product, a little over one-third of a bushel to each inhabitant.

5. Increase of Wheat Product in the Middle and Western States, North of Ohio River and Latitude 40°

In 1840 the six north-western states, including New York and Pennsylvania, produced 51,979,846 bushels, or sixty-one per cent. of whole product, being seven bushels per acre to each inhabitant. In 1850 they produced 79,347,973 bushels, being seventy-nine per cent. of the whole crop of the United States, or seven bushels per acre for each inhabitant. Including Virginia, whose mountainous district is favorable to wheat culture, this district in 1850 produced ninety per cent. or nine-tenths of the whole wheat product of the Union. These statistics determine the districts of actual wheat production and indicate the constant and inevitable tendency of wheat culture to withdraw itself into those districts where it gives the best returns.

6. Zone of Maximum Wheat Production.

The wheat-producing district of the United States is confined to about ten degrees of latitude and six degrees of longitude, terminating at the west on the 98th parallel. But the zone of its profitable culture occupies a comparatively narrow belt along the cool borders of the district, defined for inland positions by the mean temperature of 65° on the north and 71° on the south for the two months of July and August. This definition excludes all the country lying south of latitude forty degrees except western Virginia, and north of that it excludes the southern districts of Pennsylvania, Ohio, Indiana, Illinois and Iowa, while it includes the northern parts of those states, Canada, New York, western Virginia, Michigan, Wisconsin, Minnesota and the Red river and Saskatchewan valleys. In general terms it may be stated that the belt of maximum wheat production lies immediately north of the districts where the maximum of Indian corn is attained.

7. Principal Seats of Production.

The actual areas of profitable wheat culture are reduced to a still narrower compass by local causes, which distribute the seats of maximum production along this zone according to geological structure, soil and moisture. Blodgett says "The immediate valley of the Mississippi, from the gulf to central Iowa, and along the Ohio to Cincinnati, is too humid and tropical for wheat. Most of the low prairies and woodlands of the states bordering these rivers are

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unfavorable for the same reason." From the wheat district must also be subtracted the cold and elevated uplands of the northern states and Canada. New England, which in 1850 yielded only one-third of a bushel of wheat for each of its inhabitants, is excepted for reasons of soil and climate. The aggregate area of all the states east of the Rocky mountains traversed by the zone of profitable wheat culture, and from which comes nine-tenths of the wheat product of the country, is 522,622 square miles, in not one-half of which wheat is a preferred crop. Wheat may be said, therefore, to be a successful crop in only one-tenth of the surface of the United States. To this limited tract the constantly increasing population of our own country and a large proportion of that of Europe must look for their supply of food.

8. Gradual Centralization of Wheat Culture in the Upper Belt of North-western States.

But while statistics show the general transfer of wheat culture to the climatic zone most favorable to its development, they also reveal the fact of a rapid decline of wheat culture in its oldest and favorite seats in this preferred belt, with a constant tendency to concentrate itself in the upper districts of the north-west. The following table will illustrate this fact:

Table showing the number of bushels of wheat to each inhabitant, produced by the several States of the wheat zone in 1840, 1850 *and* 1859.

	1840.	1850.	1859.
New York,	5	4	4½
Pennsylvania,	7¼	6½	6
Virginia,	9	8	
Ohio,	10	7½	7
Michigan,	10	13	
Indiana,	6	6½	
Illinois,	7	11	6
Wisconsin,	7	14	
Iowa,	3	8	5
Minnesota,			20

The decline being in Ohio, New York, Virginia, Pennsylvania and Iowa, and the increase in the upper states of the north-west. Ohio in 1839 produced 16,000,000 of wheat, in 1859 only 17,000,000.

9. Causes of the Transfer of Wheat Production to the Upper North-west.

This relative decline is occasioned partly by deterioration of the old wheat soils from bad farming; partly from inability to compete with the cheaper processes of western husbandry, but mainly from the fact that wheat has proved an unreliable crop in these states, and has been superseded by other crops less exposed to atmospheric and other casualties.*

For the great agent, after all, which is gradually transferring wheat culture to the higher latitudes of the north-western states, is the constant liability of the more southerly districts to the ravages of insects and to rust, mildew and blight, originating in the low humid condition of the atmosphere during the ripening period. Blodgett says: "When the humid, tropical heats intrude into the cooler zone, as over much of the interior plain below Cincinnati, from the gulf to Central Iowa, wheat can not be grown. The greater part of the United States is liable to these extremes as temporary conditions originating rust, mildew, blight, and probably the injury which in southern Illinois renders the grain unhealthy as food."†

* Maryland and Delaware were formerly great wheat states. Now wheat does not pay the cost of cultivation there. Dutchess County, New York, that formerly produced forty bushels to the acre, now yields less than sixteen. The same deterioration is seen in the Genesee valleys.

The farmers of Ohio are seriously asking the question "shall we continue the culture of wheat or shall we abandon it?"—*Ohio Agricultural Report.*

† Solon Robinson, a prominent agricultural writer, says: "In southern Indiana, Illinois, all of Kentucky, Tennessee and northern Missouri, wheat is affected by the rust. It is the most precarious crop in the west, and altogether unsafe to rely on."

The perils to which wheat in Ohio is annually exposed, are thus described in the Ohio Agricultural Report of 1857. "Wheat is liable to be winter killed, then to be attacked by the Hessian fly, then by the Vitrio Titici, then by the midge, the thrips, and a host of other insects, then by rust, and last by smut," to which the writer might have added *summer frosts.*

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The condition of the atmosphere here described, sultry moist heats, is unknown on the elevated table lands of Minnesota. Frequent electric showers constantly purify the atmosphere. The round of diseases and the armies of insects to which wheat in lower latitudes is exposed, have never yet visited our fields.

10. The Comparative Certainty of the Wheat Crop of Minnesota.

As a consequence of the foregoing facts, the wheat crops of Minnesota are exempt from the serious and often ruinous fluctuations of product to which more southerly states are exposed.

Iowa, oscillating in three years between four bushels and fourteen bushels per acre; Illinois between three and fifteen bushels; Ohio from eight to seventeen and three-tenths bushels, must surrender the culture of wheat to the sheltering immunities of more northern climates.

11. Comparative Value of Minnesota Wheat.

Finally, as a result of its exemption from an unhealthy atmosphere, from smut, mildew, blight, rust, and insects, wheat culture must be attracted to Minnesota and the Red river valley, by the superiority of their grain. As compared with the grain of other states, the weight of Minnesota and Red river wheat is as follows:

Minnesota wheat,	62 to 65 lbs.	to the bushel
Red river, "	64 to 70 "	" "
Illinois, "	54 to 58 "	" "
Ohio, "	58 to 60 "	" "
Pennsylva'a, "	58 to 60 "	" "

The soundness and fullness of the Minnesota grain is unmistakably indicated by the fact that *it commands a higher price* in the market than any western grain, when it goes to market unmixed. From the inexperience of our farmers in selecting wheat for market, they constantly, and almost universally put up their wheat with all varieties mixed, a deterioration equal to a decline of nearly ten per cent. in value.

12. Synopsis of the foregoing Argument.

The following facts, then, are demonstrated by statistics:

1. That there exists a constantly and inevitably increasing foreign demand for American breadstuffs, with a constantly increasing demand for domestic consumption, accompanied by a constant diminution of the relative supply.

2. That therefore the value of wheat, as a commercial staple, is advancing in a compound ratio.

3. That physical and economical causes imperatively restrict the limits of wheat culture to the seats of its maximum production, in less than one-third of the states of the Union, within a climatic belt, having an estimated gross area of only 260,000 square miles, from which nine-tenths of the American supply of bread, and a large and constantly increasing amount of foreign food must be drawn.

4. That, within this zone, the same climatic and other causes tend to concentrate the growth of wheat in the upper belt of north-western states, always preferring the best wheat districts.

5. That Minnesota, and the country north-west of it, is the best of these wheat districts, having the largest average yield, the most certain crops, and the best and healthiest grains.

6. That, therefore, the production of wheat must be thrown, with a constantly increasing pressure, upon the resources of this district to supply the constantly expanding markets of the United States and Europe, giving a full development to its agriculture, and the highest value to its soil.

13. Profits of Wheat Culture compared with Corn Growing—Illustrating the Comparative Profits of Agriculture in Minnesota.

It is usual everywhere to extol the value of corn as a commercial staple, and to assign a subordinate rank to wheat. The facts we have cited show that

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wheat is rapidly gaining a position in the markets of the world, which corn can never attain. It would not be difficult to show that even at its present commercial value, wheat is a more profitable crop than corn, when both are grown on conditions most favorable to success. These conditions, we have shown, exist, in the case of wheat, prëeminently in Minnesota. Ohio is undoubtedly the most successful of the states as a corn grower. A comparison of these states, therefore, in respect to the relative profits of wheat and corn growing, will illustrate the agricultural advantages of Minnesota.

From an acre of ground in Ohio, producing thirty-three bushels of corn, the average yield of nine years, at forty cents per bushel, the average nett price realized to the farmer in the same period, the gross proceeds will be $13.20

From an acre of ground in Minnesota, producing twenty bushels of wheat, at 88 cents, the average Chicago price, less the average cost of transportation from Minnesota, the gross proceeds will be $17.60

The difference in the gross proceeds in favor of wheat culture in Minnesota, being $4.40.

This does not, of course, represent the actual gains of agriculture in Minnesota over Ohio. The true difference is much increased in favor of Minnesota, by the diminished cost of cultivation. Arising (1,) from the comparative cheapness of land in Minnesota, and, (2,) from the facilities afforded in prairie tillage for the unlimited use of labor-saving machinery. As the price of land advances, therefore, the increase of capital will be accompanied by a corresponding increase of the *facilities*, and decrease of the *cost* of cultivation. A Minnesota farm presents a more favorable field for the *active* employment of capital, in the shape of machinery, than the Ohio farm. In the latter, the proportion of *fixed* to *operative* capital is much greater than in Minnesota. Therefore, the interest on the unemployed capital of a farm, which must be computed as an element in the cost of production, is relatively greater in Ohio than in this state.

To include these elements in the comparison, the following is a general statement of the advantages of the Minnesota wheat-grower over the corn-grower of Ohio.

The average cost of an Ohio farm is . . . . . $21 per acre.
The average cost of a Minnesota farm would not exceed . $5 "

The cost of cultivating an acre of wheat in Minnesota, interest excluded, is $6.75, estimating labor at its market price. The cost of cultivating an acre of corn in Ohio, interest excluded, is stated to be $7.60 per acre. Now, to compare the nett results of the cultivation of these respective staples of Ohio and Minnesota, we have the following figures.

Ohio Corn.

One acre corn, thirty-three bushels, at forty cents, . . .		$13.20
Cost of production, ...	$7.60	
Interest on cost of one acre, $21, at seven per cent., .	1.47	9.07
		$4.13

Minnesota Wheat.

One acre wheat, twenty bushels, at eighty-five cents, . .		$17.00
Cost of production, at market price of labor, . . .	$6.75	
Interest on cost of one acre, at $5, ...	.35	7.10
		$9.90

Difference in favor of Minnesota, in nett value of product per acre, $5.77.

14. COMPARATIVE PROFITS OF WHEAT CULTURE IN OHIO AND MINNESOTA.

To extend this comparison to the local advantages of these states respectively, for growing wheat, in which Ohio now occupies the first rank among all the states, as to the actual quantities produced, the following results will appear:

The average yield of Ohio, is thirteen bushels per acre; of Minnesota, twenty bushels. It costs certainly no more, and considering the comparative cheap-

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ness of prairie tillage, it costs, eventually, much less to cultivate an acre of wheat in Minnesota, than in Ohio, but in the present state of agriculture in Minnesota, the cost may be stated as the same. The prices of wheat at Cincinnati for nine years, has averaged $1 per bushel. It has been about the same at Chicago. The cost of transportation from Minnesota to Chicago, will average fifteen cents per bushel of wheat. Combining these elements, we have the following tabular comparison of the profits of wheat culture in the two states.

Minnesota.

One acre wheat, twenty bushels, at $1,		$20.00
Cost of production,	$6.75	
Interest on cost of land, $5 per acre,	.35	
Cost of transportation to Chicago, fifteen cents per bushel,	3.00	$10.10
Profit per acre in Minnesota,		9.90

Ohio.

One acre wheat, thirteen bushels, at $1,		$13.00
Cost of production,	$6.75	
Interest on cost of land, at $21 per acre,	1.47	8.22
Profit per acre in Ohio,		$4.78

15. Primary Cost and Profits of Farming.

The following statements, in answer to my interrogatories, are from E. P. Mills, Esq., of Faribault, Rice Co., a highly respectable farmer, whose experience and judgment give his figures the force of authority.

(1.) "*Cost of Wheat Growing.*—The average yield of wheat per acre, in this county, in the best years, I estimate at twenty bushels. Most men set the figure higher, and many men raise more, but I think the average not above twenty bushels. On land already broken and fenced, the first item of cost is the plowing, which should be done in the fall, and is worth . $1.25 per acre.

One and one-half bushels of seed,	.75	"
Sowing and harrowing in,	.50	"
Harvesting and stacking,	2.25	"
Threshing and cleaning,	2.00	"
	$6.75	

This is about the cost of an acre of wheat according to my experience. A yield of twenty bushels per acre, at the present price, fifty cents,* leaves a profit of $3.25 per acre, not counting the use of money invested in land, tools, fences, &c.

(2.) *Labor Cost of Corn, Rye, Potatoes.*—The cost of corn per acre is about as follows:

Plowing land,	$1.25
Marking and planting with planter,	.50
Seed,	.10
Three days' work man and horse with shovel, plow or cultivator,	3.75
One day's work weeding between the stalks,	1.00
Picking the corn per acre,	1.25
	$7.85

Average yield of corn per acre about thirty-five bushels, which may be worth from twenty to forty cents and profits accordingly. One object of raising corn is to destroy weeds and benefit the land, as all land must be planted as often as every third year. The cost per acre of raising oats is about the same as wheat, and they yield the same weight of grain or twice as many bushels. Oats are little raised except for home consumption, the price being uncertain. Winter rye is largely raised in this section at about the same cost per acre as wheat; it

*This was in December. It is at least twenty-five cents less than the average price of wheat. At seventy-five cents per bushel the profit per acre will be $8.25.

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yields about the same and is a sure crop. The cost per acre of raising potatoes is about ten dollars; the average crop per acre, two hundred bushels; price very various, but they are always valuable for feeding stock. These estimates are made on the supposition that a man hires all his labor, counting his own trouble nothing, or works himself and charges the common price for his labor.

(3.) *Cost of Opening a Farm. Directions to Emigrants.*—The cost of opening a farm is far less now than at any former period. Counting at government price, one hundred and sixty acres is two hundred dollars. The cheapest and best fence, where lumber is cheap, say ten dollars per thousand, the common price in this section, is made of boards one inch by six and fourteen feet long, and two posts for every length of boards. In this section the boards are of bass wood or oak and the posts of oak, cedar or red elm, and the cost of fence complete, forty cents per rod. One mile of fence, inclosing forty acres, would cost 320×40=$128; though most have neighbors who help build line fences. Rail fences cost about the same; but if a man has timber and help he can build them himself. Much or very little may be expended in buildings. A man may build a comfortable house of logs by paying, say fifty dollars for lumber, nails, shingles, windows, &c., and he may make comfortable quarters for stock with poles and straw only, and men seldom put grain in barns when they have them. Horses are worth at present $50 to $100 each; oxen $40 to $50 per yoke; cows $20 each. Ten years' observation in this country leads me to the conclusion that tact, energy and enterprise, and a well settled purpose, are vastly better capital for an emigrant than money; and with the amount of money which I shall give, some would easily succeed; with twice that others would fail, but it is highly desirable that all emigrants should have

The price of their land,	$200.00
" team and wagon,	150.00
" two cows,	40.00
For building house,	100.00
Breaking twenty acres,	60.00
One steel plow, for crossing,	14.00
One harrow,	6.00
Axes, shovels, spade, forks, scythes, &c.,	25.00
House furniture and provisions for family, which must be bought till they can raise them,	200.00
	$795.00

Some men have started with nothing, and by working out or hiring farms have soon secured homes of comfort, and others will do the same; but to do this requires peculiar material in the man and his wife, and usually families with $500 to $1,000 on their arrival find they have need of the strictest economy.

Land should never be broken after July, and that broken in June needs no cross plowing for a crop the next season. One man with a good span of horses can cultivate easily and well forty acres of land without hiring help except in harvest. The cost of keeping a span of horses is little felt by a farmer. Oxen will work in the breaking team and grow fat on the grass they eat at night. They will work in the hottest weather, and they seldom or never loll as they do at the east. It is pretty generally admitted that the farmer should cultivate no more land than he can do himself except in harvest; forty acres under plow is commonly enough. A family of five will eat fifty bushels of wheat, sixty or seventy bushels of potatoes, two hundred pounds pork in a year, and more or less groceries and other things according to their ability to buy. Potatoes, turnips, melons, &c., thrive well on the newly turned sod, and corn often yields half a crop. Beyond all question wool is the best crop to raise for export in Minnesota, and all our farmers should turn their attention to the raising of sheep as soon as possible. The freight on one hundred dollars worth of wool is not as much as on five dollars worth of wheat, and sheep do better here than in any of the other western states. In this section native hay is of good quality and very plenty; it usually sells for from two to three dollars per ton. It will readily be seen that the fixed capital of a farm in stock, implements, buildings and fences has no limits, and it is chiefly in the increase of this capital that the

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farmer is to look for his wealth. It is doubtless true that the best course for an emigrant at present, who has $1,000, is to buy at second-hand, as many men have become embarrassed and will sell for less than the improvements cost, and try again. A person coming to this country has a vastly better chance than those who came in the first settlement."

The following deductions may be made from these thoroughly matured statements, for the benefit of immigrants with little or no capital:

1. That a single man with a span of horses can cultivate forty acres of land.

2. Supposing, for the sake of simplicity, that this is all in wheat, the results of his labor at the end of the harvest will be 800 bushels, at seventy-five cents, worth $600, out of which he will receive $200 for his own labor, and must pay for hired labor and seed about $60, the actual profit upon the forty acres being $540, including his own wages.

3. For an additional forty acres he will receive no portion of the wages, but simply the profit after deducting wages. This will leave a net profit of $340 for the forty acres. For every additional forty acres a like profit will be realized. We have then this result of nett profits upon different scales of farming:

Upon 40 acres of wheat,		$540	or $13.50	per acre.
" 80 " "		880	" 11	"
" 120 " "		1,220	" 10.25	"
" 160 " "		1,560	" 9.75	"

This is the result of six months' labor. The ordinary system of farming is of course necessarily more complex than this. But items of expenditure which do not appear are more than balanced by the sources of profit from the Dairy, the Garden, the Orchard, and the Stall.

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CHAPTER V.

CONDITION AND PROGRESS OF AGRICULTURE. ANALYTICAL REVIEW OF THE CROPS OF 1859.

1. General Results of Agriculture in 1859.

In the fall of 1859, before the Bureau of Statistics was established, I undertook, with a view to public information, to collect the statistics of the crop which had just been harvested. For this purpose a thorough unofficial canvass of the state was instituted by means of circulars addressed to every township, through the supervisors. In answer to these a mass of local estimates, for two or three hundred townships, was received. These were often confused and contradictory, but with sufficient agreement and explicitness of detail to afford a reliable rule of averages on which to base an estimate for each county. The resulting estimates for the state were reported, before being fully matured, to the Governor elect, and as embodied in his inaugural message are as follows:

Statistics of Agriculture in Minnesota for 1859. *Tilled Areas.*

Whole number of acres under cultivation,	464,000
Number of farms,	21,533
Average number of acres tilled in each farm,	21½

Products.

Number of bushels of wheat harvested,	3,435,950
" " corn "	3,476,950
" " oats, "	3,309,480
" " potatoes about,	2,000,000

Subsequent investigation led to the conclusion that the local reports, from which these estimates were deduced, had not allowed sufficiently for the damage done to corn by the premature frosts of September, especially in the interior southern and south-western counties, where it destroyed two-thirds of the entire crop.

In Table XI, in the Appendix, are presented the best estimates I could make upon the imperfect data before me, of the principal crops of the several counties in this state for 1859. It is proper to state that the figures given have no pretensions to accuracy of local detail, and are given as mere general approximations. I should, however, explain that the results stated for the counties are not aggregates of the township estimates reported to me, except in the few instances when these contained strong internal evidence of a personal canvass; that I have used the local reports simply to ascertain a definite rule of averages for each county, that I have uniformly used the lowest averages which the data before me would admit of, and, finally, that as the result of this method, the quantities I have given are from twenty-five to thirty per cent. *below the actual quantities* reported. Under these circumstances, the general results for the state are likely to be much nearer the truth than the local details. The following are the sums of the county estimates, being the general results of agriculture in Minnesota in 1859.

Extent of Tillage.

Whole number of acres under cultivation,	454,200
Number of farms,	21,600
Average number of acres tilled in each farm,	21

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Products.

	Acres.	Number of bushels harvested.
Wheat,	164,955	3,288,900
Corn,	132,066	3,130,500
Oats,	104,800	3,420,000
Potatoes,	17,000	2,228,800

Average Yields.

Wheat,	20 bushels per acre.
Corn,	23 " "
Oats,	34 " "
Potatoes,	125 " "

It will be convenient to review these crops in detail.

2. WHEAT PRODUCT COMPARED WITH OTHER STATES.

The aggregate product of wheat is stated at 3,288,900 bushels, at least twenty-five per cent. *below* the actual quantities reported to me or deducible by the rule of proportion from the local estimates. This shows an average of eighteen and three-quarters bushels to every inhabitant of the state, assuming the population at 175,000. We can find but two parallels to this proportion in the statistics of American agriculture. Ohio in 1850 produced seventeen bushels of wheat to each person, and in Michigan the crop of 1848 gave twenty-three and one-half bushels to each inhabitant. The following figures will exhibit this favorable comparison of Minnesota with other wheat states:

	Bushels to one inhabitant.
Minnesota, 1859,	18¾
Ohio, 1850, (greatest known yield,)	17
Ohio, average yield for nine years,	8
Michigan, 1848, (greatest yield,)	23½
Michigan, 1849,	12½
Wisconsin, 1849,	14
Illinois, 1849,	11
Iowa, 1849,	8
Iowa, 1856,	9
Iowa, 1859,	3½

A comparison of actual quantities shows that Minnesota raised in 1859, in what may be called the fourth year of her agricultural existence, with a population of 175,000, more than fifty per cent. more wheat than was raised in Iowa, with a population of 633,449, and more than one-fourth of the wheat crop of Ohio as estimated by the Commissioner of Statistics of that state.

Comparative Wheat Crops of 1859.

	Population.	Number of bushels.
Minnesota,	175,000	3,288,900
Iowa,	633,449	2,105,608
Ohio,	2,500,000	12,000,000
Wisconsin, 1850,	304,756	4,286,131

If Minnesota exhibits this degree of relative preponderance as a wheat-growing state, with one-third of her tillage in wheat, it is reasonable to suppose that with the expansion of her agriculture in the direction so strikingly indicated by her interests, she will ere long outweigh, in the actual quantities of her wheat product, any other state in the confederacy.

The Average Wheat Yield per Acre.—The average yield of wheat deduced from the aggregate of local estimates is twenty bushels to the acre. We must observe here that if the township reports were to be taken "at their face" the average yield for the state would be not less than twenty-three bushels per acre. But experience has taught us to allow largely for the disposition to base general inferences on the most striking and notorious instances, and for the general habit of confounding a *usual* result with an *average* one. The reports from the townships, however, reveal a remarkable uniformity in the yield of wheat throughout the state, the difference in localities not being decided enough to

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warrant any special discrimination. If any district is entitled to the distinction of being the best wheat district of the state, it should perhaps be awarded to the south-eastern counties of the state, located on the limestone formation, and including the southern portions of Washington, a corner of Ramsey, and the trap soils of Chicago, where, though the average does not perhaps exceed that of other localities, the *range* of yields seems to be higher, thus vindicating the preference given by Owen to these districts for wheat soils.

In the whole eastern slope of the Mississippi, with some local exceptions, the wheat harvest gives results very much below the rest of the state, partially the effect of drouth, but mainly from the inferior character of the soil. The following tables, in which the counties are grouped in natural geographical divisions, will show the range of the yields reported to me, and the average results:

4. LOCAL YIELDS OF WHEAT PER ACRE, 1859.

Eastern Slope of Upper Mississippi.

	Range of ordinary yields. Average of townships.	Average yield.
Anoka,	15 to 20,	18
Benton,	12 to 18,	15
Sherburne,	12 to 18,	15
Morrison,	10 to 15,	12

Average yield of district, fifteen bushels.

Western Slope of Upper Mississippi.

Hennepin,	15 to 25,	20
Wright,		20
Stearns,	18 to 25,	20
Meeker,	18 to 25,	20
McLeod,		20

Average, 20.

St. Croix Valley and Ramsey County.

Washington,	20 to 24,	22
Chisago,	20 to 35,	28
Ramsey,	15 to 30,	20

Average for district, 22.

Minnesota Valley.

Scott,	15 to 25,	20
Carver,	15 to 25,	20
Sibley,	18 to 22,	20
Le Sueur,	18 to 25,	20
Blue Earth,	18 to 30,	20
Faribault,	15 to 35,	20
Nicollet,		20
Brown,		20

Lower Mississippi Valley.

Dakota,	16 to 25,	20
Dodge,	15 to 23,	20
Rice,	18 to 30,	20
Goodhue,	16 to 25,	20
Wabasha,		20
Steele,	22 to 23,	22
Waseca,		20
Winona,		20
Olmsted,	20 to 25,	20
Houston,	20 to 25,	22
Fillmore,	19 to 25,	20
Freeborn,		20
Mower,		20

The range of township averages here given, in which the higher extremes preponderate, justify us, we think, in placing the general average for the state at

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twenty bushels, although it is not improbable that the census will show some local exaggeration in the reports from which this deduction is made.

5. Comparison of Wheat Yields with other States.

In another place, assuming twenty bushels per acre as the standard of wheat production in Minnesota, we compared this result with the average yields of the best wheat-growing states in the Union, showing that Minnesota returned five bushels per acre more than Pennsylvania, six more than New York, Iowa, or Wisconsin, nine more than Illinois, and ten more than Michigan in 1850, and seven more than the average of Ohio for a period of nine years. But if the yield of 1859 in Minnesota is regarded as exceptional—the result of a remarkably favorable season—it will be instructive to compare it with the *extraordinary* crops of other states. The Minnesota yield compares with the *largest* recorded crops of other states as follows:

	Bushels per acre.
Minnesota, 1859,	20
Ohio, 1850,	17½
Michigan, 1848,	19
Iowa, 1856,	14

These are all the maximum instances we can find, and the comparison is strikingly favorable to Minnesota, supposing her crop to be unusually heavy. There are strong reasons, however, for believing that the wheat yield of 1859 was less in its average results than that of some previous years, and that twenty bushels per acre fairly represents the average crops of Minnesota during the five years of her agricultural experience. It may be less in future from the extension of cultivation over poorer soils, and from the local casualties to which large breadths of culture are exposed.

6. Comparative Exemption from Casualties.

But the Minnesota farmer has this advantage over his competitor in more southern and eastern districts in the cultivation of wheat; that from the nature of the soil and climate of this state he is to a great extent exempt from the disastrous fluctuations of the wheat product to which these districts are exposed. We have elsewhere shown that the uncertainty of the wheat crop in these sections, arising from the dangers to which it is exposed, from weather, disease, and insects, is fast transferring the culture of wheat to the cooler and more elevated plains of the north-west.

(1.) *Disease and Insects.*—It may be distinctly affirmed as a deduction from the uniform answers to our specific inquiries in relation to the liability of wheat in Minnesota, to the diseases and insects which elsewhere prevail, that both these classes of casualties are unknown, except partial traces of rust and blight in the extreme southern counties, and of smut in some varieties of wheat. Yet every two years these casualties cut off a quarter or a third of the crop of eastern states.

(2.) *Casualties of Weather.*—The weather of 1859, in the remarkable intrusion of frosts, into the growing season, and its extremes of heat and moisture, so far from being particularly favorable to wheat, may be regarded as a very severe test of the security of wheat culture in Minnesota,

On the 4th and 5th of June occurred a frost over a large portion of the state, which cut down the corn blades without, however, injuring the permanent growth of the plant, and, in many places, killed garden vegetables. But wheat suffered no damage whatever. This frost was not a local phenomenon. The telegraph reported its ravages throughout Iowa, Illinois, Ohio, Pennsylvania, and nearly every Middle state. We have before us, in the report of the Commissioner of Statistics of Ohio, a detailed account of its ravages in that state. In nearly every county the wheat crop of 1859 is reported as damaged from one-half to three-quarters, or as totally destroyed by the frost of June 4th. Minnesota did not lose a kernel of wheat from a cause which destroyed half the crop of Ohio. By consulting the Army Meteorological Register, it will be seen that Ohio is frequently subject to summer frosts, and Minnesota very rarely. We

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have elsewhere shown the general exemption of Minnesota from the peculiar atmospheric conditions which generate many of the diseases to which other districts are exposed. By reference to the table of agricultural casualties, it will be seen that in Benton, Sherburne and Morrison counties, a severe drouth affected the crop, while in Brown county the excessive rains of midsummer are complained of. Except these local extremes, the crop passed through all stages of growth without accident or injury from any cause. Yet drouth, frost, storm and rain, annually destroy one-third of the wheat crop of the United States.

7. Possible Fluctuations of the Wheat Yield Compared with other States.

These facts corroborate the assertion elsewhere advanced, that the wheat crop of Minnesota is exposed to no disasters which can occasion a greater variability in its annual average yield per acre, than is the corn crop in the states most favorable to that plant generally—exempt, in fact, from dangers which occasion two-thirds of the annual destruction of wheat. But allowing for the causes of disturbance that remain, for occasional smut and rust, for liability to drouth at long intervals, for storm and excessive rains their full effect, thirty per cent. deducted from the yield of the present year will be a liberal allowance for the possible fluctuations of the wheat yield of Minnesota, between the best and worst years. This, compared with other states, would give the following range of average yields in a series of years.

Minnesota, 1859,	20	bushels per acre.
Estimated minimum,	14	" "
Difference,	6	" "
Ohio, 1850, maximum,	17½	bushels per acre.
Ohio, in 1859, minimum,	7	" "
Difference,	10½	" "
Michigan, 1848, maximum,	20	bushels per acre.
" 1849, minimum,	10	" "
Difference,	10	" "
Iowa, 1856, maximum,	14½	bushels per acre.
" 1859, minimum,	4½	" "
Difference,	10	" "

If it is considered presumption to fix a minimum for the wheat yield of Minnesota, in advance of experience, we can only say that, having ascertained the ordinary causes which produce the wheat losses of other districts, and the extent of loss due to each, and the partial or general immunity of Minnesota, from these causes, the losses to which wheat is exposed in Minnesota, from what remains, becomes a matter of calculation, sufficiently definite for a general statement.

8. Winter Wheat.

(1.) *Permanent Conditions of its Success.*—Nearly all the wheat crop of 1859 was spring-sown, and, following the example of other north-western states, winter wheat has not been generally tried throughout the state. In many localities, where it has been tried, the result has not been deemed favorable to its reputation as a reliable crop, and from the experience, especially of the last two or three winters, an opinion has extensively grown up that winter wheat can not be successfully grown in Minnesota. This opinion is not warranted by facts. It must be recollected that the agricultural experience of Minnesota extends over a period of only five years. Now the success of winter wheat depends peculiarly on having a moderate and sure covering of light snow, not condensed by thaws, and packed close by warm winds. Such a snowy covering requires, firstly, a moderate fall of snow, and, secondly, a low, uniform range of winter temperature, free from winter rains and prolonged thaws, sufficient to dissipate the snowy covering. These are, in fact, the decided characteristics of

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Minnesota winters. The mean winter precipitation in snow, is twenty-two inches. The Army Meteorological Register shows that during nineteen years of observation, this fall was nearly uniform in its oscillations in cycles of five or six years, from minimum of five or six inches, to a maximum of two and three feet. It is remarkable, also, that light falls generally coincide with quite low temperatures; that the heaviest falls are usually in the months of November and December.

For a period of thirty-five years, embraced in the Army Register, the monthly means never once rose above freezing point. Whatever may be the range of temperature within the monthly periods, there certainly can not be very prolonged thaws in such a climate. In fact the maximum degrees of heat noted in the whole period of thirty-three years, were for January, 42°; for February, 46°; and for December, 43°. The daily fluctuations are not given, but these facts are sufficient to show the general freedom from prolonged thaws.

The short noonday heats, which often carry the thermometer for an hour or two above freezing point in the winter, are not sufficient to create a thaw, and even a whole day, but slightly above freezing, will not seriously affect the snow.

(2.) *Temporary Causes of Failure.*—To quote from the elaborate paper on Climatology, by Mr. Shephard, the number of days in recent winters when the record was *at* and *above* freezing, is as follows:

	6 A. M.	2 P. M.	6 P. M.	Mean Temperature
1855–6,	3 days,	19 days,	8 days,	3.09
1856–7,	1 "	14 "	3 "	9.20
1857–8,	7 "	40. "	19 "	21.02
1858–9,	7 "	33 "	19 "	13.57

This record explains the general failure of winter wheat, as a prairie crop, for three or four years past. In two winters, of almost unparalleled severity, succeeded by a winter of almost unparalleled mildness, accompanied with an unusual deficiency of snow, the success of winter wheat could hardly be expected. Looking back through the long column of meteorological and hygrometrical records of Fort Snelling, it is difficult to find another group of winters so unfavorable for this experiment. The facts, however, are sufficient to show that winter wheat is unreliable as a prairie crop. But Minnesota contains some eight thousand square miles of fertile woodland, and a thousand more of valley lands, in which the cultivation of winter wheat has met with decided, and so far as we are informed, uniform success.

(3.) *Illustrative Facts.*—To specific inquiries upon this subject, addressed to the different counties, the answers from the prairie counties generally represent winter wheat as a failure, while the woodland districts are unanimous in their testimony that it does well. In Chisago county, the average crops of winter wheat are reported at thirty-five bushels per acre. Hon. Patrick Fox, a member of the last legislature, raised forty-five bushels to the acre. In Hennepin county, winter wheat is said to do well in the majority of cases. In Olmsted county, out of three years experiment, one year only was successful on the prairies, while in, or near timber, it generally succeeded well. In Rice county it has done well when sown in good season. In Dodge, out of five years' trial on the prairies, only two years gave successful results. In Scott, Le Sueur, Carver, Wright and Stearns, the woodland yields good crops of winter wheat. In Wabasha, it is said to do well in the valleys. These facts would seem to indicate that in the timber, oak openings, and valleys, occupying probably one-fifth of the arable surface of Minnesota, winter wheat is a sure crop, while on the prairies it is liable to be winter killed in two winters out of every six or eight.

9. Favorite Varieties of Wheat.

The Rio Grande, Scotch Fife, are general favorites throughout the state, having a weight, generally, of sixty-two pounds to the bushel, with a marked exemption from rust. Canada Club is said to give less weight, but to make better flour, an advantage counterbalanced by its liability to rust. The Black Sea and Tea are in high esteem. Stearns county reports some excellent fields of Red river wheat, producing thirty bushels to the acre. The same variety has recently been introduced into Ohio, where its

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large yield has attracted considerable attention. The average weight of Minnesota wheat is generally above sixty pounds, varying, however, from fifty-eight to sixty-five pounds.

10. Corn, Aggregate and Average Product.

The frosts of June 4th cut down the corn blades over a great part of the state, but without any permanent injury to the plant. The frosts of Sept. 1st, 2nd and 3d, found a large part of the crop in the milk, and caused an unprecedented loss. These incidents afford the severest tests, within the chapter of climatic contingencies, of the capacity of the climate of this state for corn, but the test is not peculiar to Minnesota. Iowa and Ohio lost far more, relatively, by both these frosts than Minnesota, and the early fall frost, especially, was far more severely felt in Iowa than here.

In the reports of the corn crop sent to me I suspect that the extent of the injury done this crop by the frosts of September were not fully apprehended, but I have not felt at liberty to make any arbitrary deductions from the quantities reported, which give an aggregate of 3,130,580 bushels from 132,000 acres, with an average yield of twenty-three bushels per acre, only a fraction less than the average yield of Iowa, in the same season; the crop of that state, according to the census, being 23,366,864 bushels from 986,096 acres, twenty-three and two-thirds bushels to the acre. The average yield of an ordinary crop of corn in Minnesota, is stated by the unanimous testimony of competent persons, to whom inquiries have been addressed, to be not less than thirty-five bushels, and in good seasons forty bushels, per acre, the preponderance of opinion being in favor of higher figures, and sixty and seventy bushels are noted as not extraordinary yields in favorable localities.

11. Comparative Fluctuations of the Corn Crop.

Assuming the lowest figure, the product of corn in 1859 should have been 4,620,000 bushels, showing a loss in the actual result of nearly 1,500,000 bushels, or one-third of the whole crop. This exhibits a somewhat wider range of fluctuations than Ohio, but less than that of Iowa, the only two great corn states of which we have any progressive statistics. A comparison of the maximum and minimum product of those states shows the following results:

Iowa, 1856, produced	42½	bushels per acre.
" 1859, "	23⅔	" "
Decrease,	44	per cent.
Ohio, 1853, highest average,	40	bushels per acre.
" 1854, lowest "	26	" "
	14	
Decrease,	35	per cent.
Minnesota, highest estimated average,	40	bushels per acre.
" present estimated yield,	23	" "
	17	
Decrease,	42 5–10	per cent.

12. Rank of Minnesota as a Corn State.

This comparison with those states of which corn is considered the peculiar, and is in fact, the preferred staple, shows that although Minnesota probably produces a somewhat less maximum than the one, and is exposed to fluctuations somewhat greater than the other, she still belongs to the first class of corn-growing states. 1849 was a good year for corn, all over the Union. The census shows the following comparison with Minnesota in the principal seats of corn production:

Illinois,	33 bushels per acre.	Iowa,	32 bushels per acre.
Indiana,	33 " "	Kentucky,	24 " "
Ohio,	36 " "	Missouri,	34 " "

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Ohio, the greatest corn field of the Union, has yielded in nine years past less than thirty-three bushels per acre. If, taking one year with another, Minnesota produced only thirty bushels to the acre, much less than the average attributed to her, she will still belong to the first rank of corn states, and looking at the fact that the corn crops of Minnesota have been heretofore produced for the most part on the sod, mainly as a preparatory crop, and against all the disadvantages of incipient cultivation, the yield of thirty-five bushels, which our farmers assert as the standard, would seem to have been too high for a general average.

By referring to the table of agricultural casualties, it will be seen that most of the loss of corn by frost fell on the extreme southern and south-western counties, Fillmore losing over two-thirds, Freeborn and Mower about forty per cent., and Blue Earth and Faribault seventy-five per cent. of their whole crop, and the result of the harvest in Iowa confirms the general observation, that the districts of the north-west defined by the latitude of our southern boundary, and below that for two degrees, are much more liable to severe frosts than any portion of the dry and elevated plain above latitude 44°.

13. Oats, Rye, Barley and Buckwheat.

Oats stand in the table of agricultural products for all the smaller grains, including rye, barley and buckwheat. Rye and barley occupy an inappreciable breadth in the tillage of the north-west, probably not more than a fiftieth of the whole tillage of Minnesota, say 9,000 acres, or less than half an acre to each farm, and this is principally barley. Both rye and barley, however, produced, as usual, large crops. Buckwheat was more extensively cultivated as a preparatory crop on new lands. The frosts of September destroyed nearly the whole of it.

The returns of oats were large. This crop has occupied a wide breadth in the northern counties, for the reasons stated under the head of "Distribution of Tillage." But the demand for forage is entirely disproportionate to the supply, and the small prices realized for the last crop will probably reduce the future cultivation. The average yield of oats is given at thirty-five bushels, greater than any of the averages grown, in the census of 1850, except Iowa, which was thirty-six bushels, and Wisconsin, which was also thirty-five. Ohio averages thirty bushels. In 1858 Ohio averaged only eight bushels per acre, from destruction caused by *rust*, of which we have heard of no indications in Minnesota, except in Mower county near the Iowa line, where oats, in 1858, were badly affected with rust.

14. Potatoes.

The superior flavor and rich farinaceous quality of the potatoes of Minnesota, afford an apt illustration of the principle maintained by Dr. Forry, that the cultivated plants come to perfection only near the northern limits of their growth. In the south, the potatoe, in common with other tuberous and bulbous plants, with beets, turnips and other garden roots, is scarcely fit for human food. "A forcing sun," says Dr. Forry, "brings the potatoe to fructification before the roots have had time to attain their proper size, or ripen into the qualities proper for nourishment." The potatoe, below latitude 44°, is invariably succulent, and inferior in flavor and meal to the product of more northern latitudes. At the east, Vermont, New Hampshire and Nova Scotia produce the favorite potatoes of the New York and Boston markets. Minnesota, at the west, reproduces the best northern samples of this delicious esculent, in characteristic perfection. From their farina and flavor the potatoes of Minnesota are already held in considerable esteem as a table delicacy in the states below us, and a market is rapidly growing up for them throughout the states of the Mississippi valley, as is indicated by increasing exports. The demand is too recent to have been much felt as yet by the producer, and but little attention has been paid to its cultivation, either as to quantities planted or in discrimination as to varieties. The consequence is that we have a small crop of potatoes, and that not unfrequently the worst kinds are brought into market. The estimated crop of potatoes, for 1859, is 2,228,000 bushels, about the crop of Iowa in 1856, and averaging about one hundred and twenty-five bushels to the acre.

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Iowa, in 1859, produced 1,497,204 bushels of potatoes, with an average yield of only sixty bushels per acre, an obvious failure of the crop from some cause, as in 1850, she produced one hundred bushels, and in 1856 one hundred and twelve bushels per acre. Several counties in Ohio, in 1858, produced only seventy bushels per acre, forty per cent. less than in 1850. These will serve for comparison.

Dakota and Washington counties report a damage of one-eighth to potatoes, from disease. In Morrison, Sherburne and Benton, drouth injured the crops thirty or forty per cent.

The reputation which Minnesota potatoes sustain in the market, and the increasing demand for exportation, ought to induce our farmers to pay some attention to the selection of the choice varieties; as the general carelessness in this respect will diminish the esteem in which our potatoe is held in southern markets, and postpone the position it is destined to hold among the staples of domestic export.

15. Sorghum.

My inquiries in relation to sorghum were not directed to the quantities planted, but to the average results of its culture. Though not generally cultivated, there were a few small patches of sorghum in nearly every cultivated county in the state. The instances of its success are numerous, as also those of its failure. Yields of one hundred, and one hundred and fifty gallons per acre are reported in several instances. Hennepin county reports an instance of three hundred gallons. The general complaint is of the want of proper machinery for its manufacture. The general opinion seems to be, that with proper culture, this plant will succeed well. The fault can not certainly lie in the capacity of the climate or soil, both of which are precisely of the character most highly favorable to the development of saccharine matter. Blodgett specially notices this as a characteristic of the "rich curve of summer development" here, enriching the stems of grasses, corn stalks and all the graniferous plants with sugar.

16. Cultivated Area.

The terms *tilled* or *cultivated lands* are here used in a different sense from the phrase *improved lands*, which, as employed in the census of the United States and individual states, embraces meadow and pasture lands, roads, and other lands not clearly defined. Thus, in Iowa, of 824,682 acres returned improved in 1850, only 426,240 acres were actually in crops. In Wisconsin less than one-half of the whole quantity returned improved, was actually tilled, and so through all the states. By tilled land, is meant land actually in crops. If my estimate of 21,600 farms, containing an aggregate of 454,200 acres under cultivation, is nearly correct, as it is believed to be, it shows the following comparison of areas under cultivation, in proportion to population, to other northern states.

	No. of Acres of Tilled Land to one Inhabitant.
Minnesota, in 1859,	3 acres.
Iowa, in 1850,	2½ "
Iowa, in 1856,	2⅔ "
Iowa, in 1859,	3⅓ "
Wisconsin, in 1850,	1⅔ "
Michigan, in 1850,	2⅔ "
Illinois, in 1850,	2⅔ "

The census of 1860, in the three last states, will undoubtedly exhibit a similar increase in the proportion of tilled land to population, to that noticed in Iowa, where the increase from 1,334,339 acres in 1856, to 2,105,608 acres in 1859, illustrates the marked effect of the commercial revulsion of 1857, in compelling the population of the western states to the pursuits of agriculture. The tillage of Minnesota was undoubtedly more than doubled in the same interval, and the census will probably show a larger breadth under cultivation than I feel warranted in stating. The tilled land of Minnesota is less than one hundredth of its whole surface, being as one acre tilled to one hundred and ten acres of its whole area. Comparison with other states exhibits the following proportion of tilled area to whole area.

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Minnesota, 1859,	1 acre in 114
Iowa, 1859,	1 " 16
Iowa, 1850,	1 " 76
Wisconsin, 1850,	1 " 68

The proportion of the tilled area of Minnesota, to its whole arable surface is about as one acre to ninety-one. The actual quantities are estimated as follows.

Whole area,	52,005,760 acres.
Arable area,	41,600,000 "
Tilled area,	454,200 "
Arable areas uncultivated,	41,145,800 acres.

17. Number and Size of Farms Compared with other States.

The whole number of farms is estimated at 21,600. The number of farms is a little more than one-half the number of voters, and would seem to be too large a proportion in comparison with other states in 1850, unless we again take into consideration the effect of the commercial troubles of 1857 in forcing a return to the cultivation of the soil. In Wisconsin, in 1850, the number of farms was one to fifteen, and in Iowa, as one to thirteen of the whole population; but in Iowa, in 1856, the proportion was one to eight. Minnesota, in 1859, had nearly the proportion of one farm to every eight persons, according to our estimates. The average tilled area to each farm, is estimated at twenty-one and a half acres. This compares as follows, with the averages of tilled land to each farm in other northwestern states:

Minnesota, 1859,	21½ acres.
Iowa, 1850,	29 "
Wisconsin, 1850,	25 "
Michigan, 1850,	24⅔ "

The greater timbered surface of Minnesota, as in Wisconsin and Michigan, reduces the average size of the farms. By inspecting the table of crops, it will be seen that in the wooded counties of Le Sueur, Carver, Sibley, Wright and others, the size of farms is given at from ten to fifteen acres, while in the older prairie counties it is placed at twenty-two and twenty-five acres.

18. Distribution of Tillage Compared with other States.

If our estimates of the proportion of tilled land in different crops are correct, the wheat crop of 1859 occupied one acre in every 2 7-10ths acres, about eight acres out of the representative farm of 21½ acres; the corn crop, one acre to every 3 4-10ths, or about six and a half acres of the ploughed field; the oats, which stands for all other small grains, about one acre to every 4½, or about five acres of the 21½; potatoes occupying about three-quarters of an acre of each farm. This, if verified by the census, does not show the relative preponderance of wheat culture which might have been expected. The large proportion of corn is especially significant, and the fatal September frost which cut off the crop, and which has its repeated equivalent in the corn growing experience of Ohio, and of Ohio emphatically in 1859, do not affect the legitimate inference of a general confidence among our farmers, in the climatic adaptation of Minnesota to corn as a staple product, a fact demonstrated by all experience. To compare the relative breadth of wheat and corn to tilled area in other states, Iowa, in 1850 and 1856, had about one-fourth her whole tilled land in wheat, and 1859 one-third, and at all times from one-half to four-fifths, in corn. In Wisconsin, in 1850, wheat occupied three-fifths of the tilled field, and in Michigan the same. In Minnesota, in 1859, a little over one-third was in wheat, and something less than a third in corn.

This illustrates the remark that Minnesota shares in equal proportions the characteristics of both Iowa and Minnesota, and divides with the one its adaptation to wheat, and with the other to corn. Local and temporary causes, however, united to decrease the proportion of wheat sown in Minnesota, corn extensively taking its place as a substitute. In Blue Earth, Faribault and other

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counties of the Upper Minnesota valley, the loss of the crops by grasshoppers, in 1858, left the farmers almost without seed, and the wheat sown did not cover one-sixth of the tilled area. As a general rule, too, the breadth of wheat tillage decreases in proportion to distance from the navigable rivers, probably because the expense of transportation to the local markets renders it less immediately profitable than corn. Hence, while the double tier of counties of south-eastern Minnesota, immediately on the Mississippi, had fully half their tilled breadth in wheat, the next ranges westward had but a third or fourth in wheat. Moreover the counties of the Upper Mississippi and of the Minnesota rivers were governed in their distribution of crops by another circumstance, and that is, that heretofore, for a number of years, the principal market has been for oats and corn to supply the local demand at St. Anthony and St. Paul, for the military posts, the pineries, &c., and never having raised wheat for exportation, an external market was not contemplated. Accordingly, the weight of wheat cultivation in 1859 lay upon the rich south-eastern counties of Minnesota, while corn and oats, and chiefly corn were planted in the Blue Earth valley, and on the eastern slope of the Upper Mississippi where the soil is not favorable to the best wheat crops. The following table will indicate the geographical apportionment of tillage for 1859.

Eastern Slope of Upper Mississippi, including the Counties of Anoka, Sherburne, Benton and Morrison.

Acres tilled,	13,400
No. of bushels of wheat,	37,800
" " corn,	110,200
" " oats,	76,000

Western Slope of Upper Mississippi—(Hennepin, Meeker, McLeod, Stearns, Wright.)

Acres tilled,	58,500
Bushels of wheat,	342,000
" corn,	558,480
" oats,	525,000

Saint Croix Valley and Ramsey County—(Ramsey, Washington and Chisago.)

Acres tilled,	24,900
Bushels of wheat,	174,200
" corn,	173,400
" oats,	403,000

Minnesota Valley—(Scott, Carver, Sibley, Le Sueur, Blue Earth, Brown, Faribault, Nicollet.)

Acres tilled,	75,700
Bushels of wheat,	344,700
" corn,	645,000
" oats,	543,600

South-eastern Minnesota—(Dakota, Dodge, Steele, Waseca, Rice, Goodhue, Houston, Wabasha, Olmsted, Winona, Fillmore, Freeborn, Mower.)

Acres tilled,	281,700
Bushels of wheat,	2,389,000
Bushels of corn,	1,643,000
Bushels of oats,	1,372,000

19. Area of Improved Land.

If to the tilled area is added what are included under the head of improved lands in the United States census—pasturage, meadow roads, and perhaps town lots—the area of reclaimed surface in Minnesota would probably be more than doubled. It is safe to say that 900,000 acres in one way or other have been subtracted in ten years from the vast wilderness of 95,000,000 acres, of which the territory of Minnesota was carved in 1849.

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20. Whole Area of Occupied Farm Lands.

The usual size of a farm in Minnesota is the government sub-division of one hundred and sixty acres. The *average* size would probably be not less than one hundred and forty-seven acres, of which we have seen a little more than one-seventh is actually put in crops, and over one-third is "improved," in the official sense of that term. The whole area of the occupied farm lands of Minnesota may therefore be stated at 3,178,000 acres, being less than one-seventeenth of the whole surface of the state, and about one-twelfth of the whole arable area.

21. Sheep and Stock Raising.

Owing to the recent settlement of the country, sheep husbandry in this state is yet in its inception. From the few statistics we have been able to collect upon the subject, it seems probable that there are not over fifteen thousand sheep in the whole state. General satisfaction, however, is expressed at the result of the experiments had, and the opinion seems to be universal that wool is destined to form a leading staple of production.

The wide range of free pasturage in Minnesota, with the remarkably nutritious character of the native grasses, form an admirable natural basis for sheep-raising. We have not, however, as yet, been able to obtain any reliable statistics of the results of wool-growing in Minnesota.

The same remarks apply even more emphatically to stock-raising. The quality of beef raised upon our northern grasses has already obtained a reputation for superior excellence, and several droves have already been carried to eastern markets from the southern counties. Two years ago nearly all the beef in our local markets was brought by droves from Iowa and Illinois; now we have already begun to export beef.

22. Agriculture among the Indians.

The advance of the Indian tribes of Western Minnesota in the arts of civilization may be seen from the following statement of the number of acres cultivated upon their lands, and the estimated product of the same in 1859, taken from the official reports:

	Total number acres planted.	Number of bushels. Corn.	Potatoes.
M'dewakanton and Wakpekutay Sioux,	1,223	42,673	5,510
Wapeton and Sisseton, . . .	1,229	45,000	1,400

The product of corn in the first line is the official estimate, the number of acres planted being nine hundred and five, showing an average yield of forty-seven bushels per acre.

23. Agricultural Surplus of 1859.

The year 1859 developed an important epoch in the agricultural growth of Minnesota. Production had apparently overtaken consumption in 1858, but without any general surplus for export. But the harvest of 1859, from a largely increased breadth of tillage, yielded a large excess of all the cereals, and Minnesota, for the first time, began to export her produce—principally wheat.

I have found it impossible to collect complete statistics of the agricultural exports of 1859. The following is the general result of inquiries addressed to the new towns.

Exports of Grain and Produce, 1859.

	Bushels.
Wheat, ...	372,625
Oats, ...	175,000
Corn, ...	47,742
Potatoes, ...	117,000

Besides this, which has undoubtedly a close approximation to correctness, large amounts of produce from the extreme southern counties went over the Iowa line to find shipment at Lansing or McGregor's landing. The local distribution of these exports will be found under the proper commercial head.

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24. Surplus Remaining after Close of Navigation.

Five or six bushels of wheat per capita is the rule of consumption. It is estimated that each horse will consume sixty bushels of oats, the number of horses on the basis of Wisconsin being about 18,000. The surplus of wheat and oats remaining over for the spring trade would therefore be as follows:

		Wheat.	Oats.
Whole crop, 1859,		3,288,900	3,420,000
Fall export of 1859,	369,625		
Reserved for consumption,	1,000,000		
Reserved for seed,	500,000	1,769,625	1,500,000
Remaining for spring shipment,		1,419,275	1,920,000

For potatoes or corn we have no rule of consumption.

These figures as announced by the Governor in his Inaugural Ad ess, were frequently received with incredulity by grain buyers. The slowness with which grain came forward to market in the fall and winter seemed to confirm their doubts as to the quantity of grain in the country, but the remarkable and unexpected activity of the spring movement has completely vindicated these estimates, at least from the imputation of being too high. Up to the close of this report the steamboats had been carrying full loads of grain from all the new towns, and there seemed to be no diminution of the supply. The opinion was generally expressed by steamboat men that the published estimates of the grain surplus were too low. As the price of wheat in the fall was only from fifty to seventy cents, the reluctance of farmers to bring it forward requires no other explanation.

25. Progress of Agriculture in Minnesota.

We have no statistics of the condition of agriculture in Minnesota since 1850. The territory was organized in 1849, when most of the small population of 6,000 souls was attached to the Indian trade. The national census of 1850 gave the following results of agriculture in 1849 in this state. As compared with 1859 the contrast is suggestive.

	Wheat.	Corn.	Oats.
1849, . . .	1,401	16,725	30,582
1859, . .	3,288,000	3,130,000	3,420,000

It was not, however, till 1854—the Sioux having been finally removed the year previous from the occupancy of the country west of the Mississippi—that the agricultural history of the state commenced. The east side of Mississippi has not now more than 40,000 acres under cultivation.

In 1849 the crops upon the tract given by the census imply a breadth of less than 3,000 acres tilled. In 1854, when it still contained all the tilled land in the territory, it is safe to assume it at much less than half the present breadth—say 15,000 acres in all—with five times the crops of 1849. The progress of agriculture in Minnesota will then be represented by the following increase since 1854:

Increase of Agriculture in Minnesota for Five Years.

	Acres tilled.	Wheat.	Corn.	Oats.
1854,	15,000	7,000	83,600	153,000
1859,	454,000	3,288,000	3,130,000	3,420,000

Thus in five years from the actual commencement of her agricultural growth, feeding in the meanwhile a population which had increased from 35,000 to 175,000, Minnesota has produced a surplus of over 5,000,000 bushels of grain.

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CHAPTER VI.

COMMERCE OF MINNESOTA.

1. Immense Range of her Natural Markets.

The position of Minnesota in the inevitable adjustments of future commercial development, as the medium of north inland and trans-continental exchanges, is of less importance as a source of immediate wealth to the people, than the necessary implications of that position as affording facile outlets in every direction for her own products, and in giving her the easiest and cheapest accesses to every part of the continent, with the consequent control of its diverse markets.

With a footing upon the great lakes, the Mississippi, and the rivers of lake Winnipeg, by lines of uninterrupted navigation to the eastern ocean, to the southern Gulf, and through the opening valleys of the north-east to the Rocky mountains, there is no other state in the Union approaching it in the breadth of its commercial horizon, in the geographical range of its markets, except Pennsylvania; but it is Pennsylvania without a New York to intercept, or a Massachusetts to divert its trade.

The broad scope of her natural circle of trade is measured by a diameter of 3,000 miles, penetrated in every part by the ramifications of her great concentral highways of water. The immense reaches of inland communications, open to the farmer, the manufacturer or the miner of Minnesota, may be seen by the following figures, reproduced from a preceding page:

Shore line of Mississippi and tributaries,	35,644	Miles.
" " Northern Lakes and St. Lawrence,	7,749	"
" " Red River, Lake Winnipeg and Saskatchewan,	6,088	"
Total,	49.481	

Exceeding the total coast line of the Atlantic and Pacific, and nearly three times the coast line of all Europe.

The actual distances of transportation by these lines are as follows:

From the head of Lake Superior to the Gulf of St. Lawrence,	1,655
From the head of Lake Superior via lake, canal and river, to New York,	1,510
From St. Paul to New Orleans,	2,082
From Breckenridge to Fort Edmonton via Red River and Saskatchewan,	1,757
Total,	7.004

2. The Natural Elements of Commerce on these Lines of Communication.

The wide range of natural markets subtended by these lines, extends from the tropics to the arctic circle, and runs through all the infinite transitions of climate and production, which lie at the basis of commercial interchange.

Looking at the characteristic staples of Minnesota and the natural wants of the allied districts, it may be said that for the chief staple of Minnesota, Breadstuffs, its Beef, its Wool, and the raw product of its mines, the northern Lakes are its natural outlet to Europe and the manufacturing districts of the East; that the Southern States of the Mississippi valley are the natural markets for its minor produce, its roots and fruits, its dairy and garden products, and its lumber; and that the North-west opens a broad field of consumption for its manufactures of wood, iron, copper, or textile fabrics. (See Chapter VIII.) In the south, from which we derive our supplies of sugar, rice and tropical fruits, all the tuberose

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and bulbous roots which are cultivated for human and animal subsistence, forced into fructification before they have had time to collect and digest their nutritive qualities, decrease in value below the 43d parallel, till in the Gulf states they are scarcely worth cultivation. The same is true of all the small pulpy fruits and berries, of flax, hemp, hops, and it especially characterizes grasses.

An imperative natural law, therefore, assigns to Minnesota and the extreme northern range of Mississippi states, the province of producing for the states below them, potatoes, onions, beets, turnips, parsnips, carrots, radishes, cabbages, plums, cherries, gooseberries, currants, and all small fruits, fresh, dried and preserved, and finally and especially, beef, mutton, butter and cheese, and even wheat. We have already shown the constantly increasing dependence of Europe and the Eastern and Southern states for breadstuffs upon the constantly narrowing circle of wheat production in the North-western states, a circle whose centre is constantly gravitating towards Minnesota. The naked prairie states of the Mississippi afford an unlimited demand for our pine lumber. We have, besides, cranberries, furs, ginseng, hides, wool and numerous other marketable commodities. Of the two million square miles which Minnesota reaches by the rivers that flow out of her heart, there is no part which does not need something which Minnesota produces, or produce something which Minnesota needs. There is, therefore, no limit to the extent of her domestic exports but her capacity of production.

3. Commercial Advantages of her Position on the Lakes.

Facility and cheapness of access to the great eastern markets is of the first importance to the success of western agriculture. These advantages are afforded to Minnesota in an eminent degree by her position at the head of the Great Lake chain. The value of this magnificent outlet on the great American Mediterranean as a channel of export for our products, may be illustrated by a few reliable figures, showing the advantages of water transit over land transit.

At a convention of the leading railroad companies held in 1859, a tariff of freight was adopted, fixing the charge for transporting first class freight from New York to Chicago at $31.10 per ton; second class, $23.20; third class, $20, and fourth class, $15.20; the average being $22.37 per ton.

To compare this at a glance with the rates by water:

Average rate of transportation by all rail from New York to Chicago,	$22.37
Highest average rate by river, canal and lake, . . .	$6.00
Difference in favor of water route per ton, . .	$16.37

It may be stated as a general rule that the charges for transportation by the lines of east and west railroad, average 2.45 cents per hundred pounds per mile at the least, while by the lines of inland navigation, the highest average rates given do not exceed 4.62 mills per hundred pounds per mile, and the average is stated by high authority to be only 2 mills per ton per mile.

Applying this rule to the actual distances to be traversed by freights from Minnesota to New York by rail and water respectively, and assuming the position of St. Paul, with respect to the points of deportation, to represent the mean distance of internal transit, we have the following results:

From St. Paul, via proposed rail, to Superior and thence by water to New York.

1st estimate at highest rates.	Distance, miles.	Average rates per ton per mile.	Total freight per ton.
To head of Lake Superior, by rail, at the present average rates of western railroad transit, .	150	$0.04	$6.00
From head of Lake Superior to New York, via lake, canal and rivers, at maximum rates, . .	1,510	.0046	6.94
	1,575		$12.94
2nd estimate at average rates.			
By rail to Superior, at average eastern rates,	150	$0.0245	$3.67
Thence by water to New York, at the true average,	1,510	.003	4.53
			$8.20

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From St. Paul, via rail route, from La Crosse to New York.

	Distance, miles.	Average rate per ton per mile.	Total freight per ton.
From St. Paul to La Crosse, by river, at present rates,	136	$0.03	$4.08
From La Crosse, by rail, to New York, at lowest rates,	1,238	.0245	30.33
	1,374		$34.41

Difference in favor of northern water route, by 1st estimate, $21.47 per ton, which would pay for the transportation of a ton of freight for a distance of 882 miles by railroad. Difference in favor of northern water route by 2nd estimate, $26.21 per ton, which would pay for the transportation of a ton of freight 1,069 miles. The reader may choose between these estimates. The 1st estimate is more appropriate to the present discussion, as it represents the earlier stages of transportation, the 2nd estimate applying rather to old and thoroughly organized routes. Assuming the former, then, the water frontage of Minnesota upon Lake Superior is shown to be equivalent, in a commercial sense, to a decrease of her distance from New York, measured upon railroad lines, of 882 miles. In other words her water communications place her on a par, commercially, with states depending on railroad outlets, which are only 442 miles from New York; for example, with south-western Pennsylvania and the upper Ohio valley. By this channel, therefore, when Minnesota shall have built a railroad to Lake Superior, it will cost no more to send a bushel of wheat to New York from St. Paul than from Pittsburg. At present a bushel of wheat is worth forty per cent. less at St. Paul than at Cincinnati. With her water outlet developed, wheat would be worth at least as much at St. Paul as at Cincinnati, as will be obvious from the following comparison of rates of transportation, taken from the published tariffs for 1860:

All rail freights from New York to Cincinnati, average of all classes, per ton, ... $18

All water freights to head of Lake Superior, and, via proposed rail, to New York, per ton, ... $12.44

4. What Minnesota Loses by the Want of a Railroad to Lake Superior.

But to compare the commercial effect of this position with other states having a frontage on the lakes, the result is quite as favorable to Minnesota. A vessel on her way from Buffalo to Chicago, for a load of grain, at a distance of sixty miles before she enters the straits of Mackinac, is at the entrance of Lake Superior and almost as near Fond du Lac as Chicago. The distance, by water, from New York to Chicago is 1,428 miles, from New York to Fond du Lac, 1,510 miles, or only 85 miles further, an inappreciable difference in transportation by water, so that, as an absolute physical fact, Minnesota is as near New York, by water, as Illinois.

For want of a railroad to Lake Superior, Minnesota can not yet avail herself of the advantages of this position on the lakes, and she is compelled to seek an outlet for her produce across Wisconsin, upon Lake Michigan. In 1859 she paid for the transportation of her wheat to Milwaukee about *fifteen* cents per bushel, to which must be added the present cost of interior transit, by team or boat, or both. A succinct comparison will show what she loses by the want of a railroad to Lake Superior.

Mean distance, and cost of internal transit, from	Distance, miles.	Cost per ton.
Minnesota to La Crosse,	200	$6.00
From La Crosse to Milwaukee,	200	8.00
Total,	400	$14.00
Mean distance, and cost of transit, by railroad, to Lake Superior,	180	$7.20
Difference per ton in favor of Superior route,		$6.80

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The difference of distance in favor of the Superior route being 220 miles, and of cost of transportation $6.80 per ton, equivalent to forty-eight per cent. Upon an export of 2,000,000 bushels of wheat, at fifteen cents of freight per bushel, Minnesota, therefore, pays Wisconsin a tariff of over seven cents per bushel, or of $144,000 in all; an actual loss to her farmers. Upon an import of 60,000 tons* she loses $408,000. These facts illustrate the economical interest which the people of Minnesota have in the construction of a railroad to Superior, regarded as a channel of transportation merely. The rules here elicited do not apply to southern Minnesota, except to such counties as have an easy access to the Minnesota river. The south-eastern counties have their natural outlet through Wisconsin.

5. Average Freight Tariff of 1859, on Produce.

	From St. Paul to La Crosse.	From La Crosse to Milwaukee or Chicago.	Total through.
Wheat, per bushel,	.05	.10	.12 to .15
Corn, " "	.03	.08	.10 to .12
Barley, " "	.03	.09	.10 to .12
Oats, " "	.02	.05	.06 to .08
Live stock, per car load,		$30.00	
Flour, per barrel,	.10	.40	.60
Pound freight, per 100 lbs. av'ge,	.10	.40	.60

6. Average Freight Tariff of 1859, to St. Louis, on Produce, from all Points in Minnesota on the Mississippi.

Wheat, 10 cents; corn, 9; oats, 6½; barley, 8; potatoes, 10 cents. Pound freight, per 100 lbs, 30 cents. The distance to St. Louis is 637 against 333 miles to Milwaukee. To carry pound freight from the river towns of Minnesota to Chicago, costs an average of 60 cents per 100 lbs.; to St. Louis, 30 cents per 100 lbs. The difference is less on produce, but the comparative tariffs strikingly illustrate the advantages afforded by the Mississippi, as a channel of transportation. This advantage is less than it would be but for the expensive modes of transportation in use on the Upper Mississippi. The steamboats in this trade were built mainly for the passenger traffic, tonnage capacity being a subordinate consideration. By inspecting the freight tariffs for 1860, in the Appendix, it will be seen that distances form an inconsiderable element in the basis of charges. It costs from 20 to 30 cents per 100 lbs. from the river towns of Minnesota to La Crosse, and about 30 cents to St. Louis. That is to say, it costs about 3 cents per ton per mile to La Crosse, and about 9½ mills to St. Louis. If, instead of the floating hotels now employed, a class of boats, like the steam tugs on the Ohio, were built especially for freights, the charges for transportation would be from one-half to one-third the present rates. The average rates of river transportation from New Orleans to St. Louis are stated, on high authority, to be but 3 mills per ton per mile.

7. Average Freights per 100 lbs. for 1859, from New York to St. Paul.

	By rail.	By lakes and rail.	By lakes, canal and river.	Via New Orleans and Miss. river.
1st class,	$2.04	1.33	$1.20	
2nd "	1.50	1.14	1.00	
3d "	1.05	0.84	0.78	
4th "	0.92	0.73	0.70	$0.65

Average freight per hundred pounds by rail, $1.38; by lakes, $1.01; by canal and lakes, $0.92; average freight by all channels, 1st class, $1.51; 2nd class, $1.21; 3d class, $0.89; 4th class, $0.74; absolute average of all classes, on all lines, $1.05. This table is not deduced from the published tariffs, which are not adhered to in practice, but from comparison of bills of lading.

8. Transit Lines of Interior Commerce.

Minnesota is, as yet, wholly without artificial highways. She has neither canals nor railroads. It is not too much to say that no other state in the Union

* This estimate of tonnage imported is from an elaborate calculation by Hon. Thomas Clark, of St. Louis County.

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without artificial lines of transit, possesses superior, if equal, facilities for the interior movements of commerce. She has (1,) excellent natural roads; (2,) a great extent of navigable water line.

(1.) *Superior Natural Roads.*—The prairie country is so thoroughly drained, and the silicious soil so absorbent of surface-waters, that the natural prairie roads which run over the high undulating uplands, have the smoothness and compactness of artificial turnpikes. This general statement has, however, numerous local exceptions, but it applies to nearly all the leading thoroughfares. This peculiarity of the internal highways of Minnesota distinguishes it from other western states. Inquiries addressed to county surveyors, and others throughout the state, as to the average weight which a two-horse team will draw for a distance of thirty miles a day, elicit the fact that the average load of a two-horse team in Minnesota, for that rate of travel, is from 2,000 to 3,000 lbs. in a majority of counties; a few counties in the extreme south-west, which have a flatter surface and not so well drained, carrying about 1,500 lbs. through the season; 2,500 lbs. may be set down as an average load in Minnesota. In Illinois, before plank roads and railroads gave her access to market, the average rate of travel in the most favorable seasons was twenty miles per day, and the average load which a two-horse team could carry, was 1,500 lbs., and in the event of a shower during the journey, traveling was next to impossible. The average Illinois load is stated at 1,000 lbs. Minnesota possesses, therefore, an advantage over Illinois, of one hundred and fifty per cent. in her natural facilities of land transit, and the comparison holds good, in a greater or less degree, with all the western states. A ton and a half of wheat can be carried one hundred miles in Minnesota for the same price as half a ton in Illinois, by her natural roads. A bushel of wheat from Waseca county can be carried to Winona for seventy-five per cent. less than, in 1848, it could have been carried from Rockford to Chicago.

(2.) *Great Extent of Navigable Waters.*—But its great extent of water-line is a conspicuous element of its internal commerce. The following table shows the extent of its coast-line, and its navigable distances.

	Coast Line.	Navigable Distances.
Mississippi river,	1,035	517
Minnesota river,	486	243
St. Croix river,	104	52
Red river,	760	380
North shore of Lake Superior, and St. Louis river,	206	185
Rainy lake and river, and Lake of the Woods,	355	155
	2,746	1,532

This result shows one mile of coast-line to every twenty-nine and a half square miles of surface, and one mile of navigation to every fifty-three square miles of surface. It will be interesting to compare this measure of the facilities of water-carriage in Minnesota with the known ratios of water-line in other districts. Europe has one hundred and fifty-six square miles of surface to one mile of coast. The whole United States, two hundred and forty-one. The Mississippi valley, thirty-four. The basin of the Winnipeg, fifty-eight. The Northern lake region, seventy-six. Minnesota has, without doubt, a greater ratio of commercial water-line than any equal portion of this continent, or perhaps of any other. To compare with an individual state, Ohio is one of the best watered states in the Union. Ohio has one mile of natural coast to 67.4 miles of surface, less than onehalf the ratio of Minnesota

9. Navigation.

(1.) *History.*—The rapid increase of the steamboat trade of Minnesota, is the best index of its commercial growth. Previous to 1823, the only means of water transportation above Prairie du Chien were Mackinac boats. It had been supposed that the Rock Island rapids would prove a barrier to navigation. But the Virginia, one of the boats recently introduced on the Mississippi, dissipated

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this illusion. This steamer, one hundred and eighteen feet long, and drawing six feet of water, arrived at Mendota in May, 1823, with Major Taliafero, the Indian agent, among its passengers, also Count Beltrami, who afterwards explored what he called the Julian sources of the Mississippi.

After the success of this experiment, one or two boats came annually with supplies for the Fort and Indian trade. In 1844, when the first record was made of the arrivals, by Philander Prescott, Esq., of Fort Snelling, the number of arrivals had increased to forty-one.

The little steamboats Otter, (Capt. Harris,) Rock River and Lynx, were then the principal boats in the trade.

In 1847, the first regular steamboat trade was established between Galena and Mendota, touching at St. Paul, by way of encouraging the little settlement. In this year the Galena Packet Company was organized, consisting of Campbell & Smith, Brisbois & Rice, H. L. Dousman, H. H. Sibley, and M. W. Lodwick.

A small steamboat of sixty tons burthen, appropriately named the "Argo," was the first boat put into the trade by the new company, the modest beginning of the splendid fleet that has since been maintained under their auspices by the profits of the trade. The Argo ran till October, when it was sunk by a snag near Wabasha.

In the summer of 1848, the "Dr. Franklin" succeeded the lost boat. She was selected to beat the "Senator," of St. Louis. Those who remember her will be amused. In 1849 the Senator was added to the line, under Capt. Orrin Smith. In the fall of that year, the Senator was replaced by the Nominee, famous as a temperance boat—and a splendid boat for those days—under Capt. Smith, now president of the packet company. The Ben Campbell was built in the winter of 1851, and ran part of the summer of 1852. In 1849, '50 and '51, the packet line ran twice a week; in 1852, three times a week. In the summer of 1852, a great steamboat contest followed; the Harrises running the New St. Paul, against the packet company. In the fall the boats consolidated. In 1854, the packet company built three new steamers; six trips a week were made. During this season the old Dr. Franklin and Nominee were unfortunately sunk. In June, 1856, the opening of the Galena and Chicago Union Railroad gave a great impetus to the trade. In 1856, the number of boats was increased by the addition of the Northern Belle and Granite State. The Lady Franklin was lost during the summer. In the winter of 1856, the Dubuque line of boats was consolidated with the packet company. The Dunleith line of three splendid boats was established. The Prairie du Chien, Hudson and St. Paul Company also put on three boats in the trade opened in the spring of 1857, by the completion of the Milwaukee and Mississippi Railroad. During the year 1858, a St. Louis Packet Company was organized with a splendid line of boats. The arrivals from St. Louis, in 1858, were 172.

(2.) *Growth of the Steamboat Trade.*

Table of Steamboat Arrivals at St. Paul, since 1844.

Year.	First Boat.	No of Arrivals.	River Closed.	Length of Season.
1844	April 6,	41	Nov. 23,	231 days.
1845	" 6,	48	" 26,	234 "
1846	March 31,	24	Dec. 5,	245 "
1847	April 7,	47	Nov. 29,	236 "
1848	" 7,	63	Dec. 4,	241 "
1849	" 2,	95	" 7,	242 "
1850	" 9,	194	" 4,	239 "
1851	" 4,	119	Nov. 8,	288 "
1852	" 16,	171	" 18,	216 "
1853	" 11,	200	" 30,	233 "
1854	" 8,	256	" 27,	223 "
1855	" 17,	560	" 20,	217 "
1856	" 18,	857	" 10,	212 "
1857	May 1,	1026	" 14,	198 "
1858	March 25,	1068	" 15,	236 "
1859	April 19,	808	" 27,	222 "

The falling off of the number of arrivals in 1859, evinces the extreme depres-

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sion of the trade in that year by the suspension of immigration. The average length of the navigable season in sixteen years, is shown to be two hundred and twenty-nine days. The earliest arrival, approximately dating the opening of navigation, was on March 25th, 1858, the latest, May 1st, 1857; the average date of opening being April 10th. The earliest closing of navigation was November 10th, 1856, the latest, Dec. 7th, 1849; the average date of closing being November 26th. The shortest navigable season on record was, in 1857, one hundred and ninety-eight days. The longest, in 1846, two hundred and forty-five days.

(3.) *Increase of Tonnage.*—The number of boats, and the aggregate tonnage in the trade in 1848 and 1858, was as follows:

1848,	2 boats,	measuring in all	240 tons	and arriving	63 times.
1858,	62 "	" "	12,703 "	"	1,068 "
1859,	55 "	" "	"	"	808 "

(4.) *Distribution of the Trade.*

The following Table for 1858 *and* 1859, *indicates the distribution of the steamboat trade of Minnesota, as to points of Connection.*

1858.	Tons.	Arrivals.
From Prairie du Chien,	977	186
From Galena and Dubuque,	3,141	293
From St. Louis and Ohio river,	7,065	172
From Minnesota river,	1,254	393
From St. Croix and elsewhere,	265	30

1859.	No. Arrivals.
From Dunleith, Prairie du Chien and La Crosse,	360
From St. Louis and other points,	148
From Minnesota river,	600
Total,	808

(5.) *Interior Steamboat Trade.*—The rapid increase of the steamboat trade upon the Minnesota river is one of the most remarkable features of this exhibit. In 1851 three boats went up the river. The stream was first ascended by steamboats in 1850. In 1852 the trade was sufficient to maintain one boat regularly; in 1855, the arrivals from the Minnesota river at St. Paul were 119; in 1857, 292; in 1858, 293; in 1859, 300.

(6.) *Navigation of the Red River.*—The first steamboat ever introduced upon the Red river, was launched at Shayenne, in June, 1859, by Anson Northrupp, and called after his name, a little boat of sixty tons. It made two trips to Fort Garry, and was laid up from some defect of machinery, to be fitted up for the trade of 1860.

(7.) *Navigation on Lake Superior.*—There were, in 1859, engaged in the commerce of Lake Superior,

Three first class steamers,	1,000 tons each,	3,000 tons.
Six first class propellers,	1,200 "	7,200 "
Twenty sailing vessels, average	300 "	6,000 "
Total,		16,200 tons.

10. Domestic Exports.

During the winter of 1859–60, I undertook to ascertain the agricultural and other exports of the state, and for this purpose addressed letters of inquiry to all the river towns. Tables IV and V, relating to a few leading articles, and compiled from apparently careful answers, give the results of my inquiries.

(1.) *Agricultural Exports.*—The following are the aggregates under different heads:

Wheat,	369,625 bushels.	Ginseng,	203,000 lbs.
Oats,	164,500 "	Hides and skins,	10,250 lbs. and 1,800 in number.
Corn,	41,376 "	Wool,	4,500 lbs. and 24 bales.
Barley,	10,000 "		
Potatoes,	123,400 "		
Cranberries,	10,300 "		

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This is a very imperfect exhibit of the shipments during the fall of 1859, except for a few leading articles.

In order to test the accuracy of the statements received from the river ports, the officers of the leading railroad and steamboat lines were applied to for statements of their receipts from the different towns in Minnesota. Statements were received from La Crosse, Prairie du Chien and Fulton city. A comparison of these statements with the bills of lading filed in some of the warehouses at St. Paul, showed that the amounts given did not for some reason cover, in some instances, one quarter the actual quantities shipped through the reporting railroads.

The following are the aggregate receipts reported at La Crosse, Prairie du Chien and Fulton:

Railroad Receipts from Minnesota.

Wheat,	156,109	bushels,
Corn,	756	"
Potatoes,	3,987	"
Hides,	20,174	lbs.
Bales of Buffalo Robes,	No. 403	
Bales of Furs,	No. 100	
Ginseng,	70,218	lbs.
Flour,	114	bbls.
Cranberries,	343	"
Butter,	3,886	lbs.

The greater part of the wheat export went to Milwaukee on the La Crosse road, which reports receipts of only 131,884 bushels. The discrepancy probably results from the fact that a large quantity of produce from Minnesota was not shipped as through freight, but taken to La Crosse by agents, and thence shipped by special contract. Except wheat, however, the largest quantities of produce went to St. Louis, from which no report was received. I shall endeavor to obtain complete reports for 1860, from the steamboat manifests.

(2.) *Grain Exports.*—The aggregate shipments of grain for 1859, was 595,490 bushels as reported, or including potatoes, 718,891 bushels.

Subtracting the fall exports from the estimated surplus, the following quantities remained for spring shipment:

Wheat,	1,609.000	bushels.
Oats,	1,650,000	"
Potatoes, vaguely estimated,	500,000	"

These estimates are confirmed by the spring business. The boats had been carrying full down loads up to the 1st of June, without any apparent diminution of the supplies. St. Paul, from which only about 13,000 bushels were shipped in the fall, had shipped in the spring up to May 15th, 1860, according to current estimates on the levee, over 100,000 bushels of wheat, and still larger quantities of oats. At Winona, Hastings, and in fact at all the river towns, the shipments were far greater than in the fall, with an increasing tendency to the St. Louis market, where Minnesota wheat is in high favor.

(3.) *Cranberries.*—The cranberry crop was very light, owing to the high water in the spring. The reported shipment of 10,300 bushels is probably much less than the usual export.

(4.) *Ginseng—Causes of the Ginseng Excitement.*—This plant, the root of which is in favor with the Chinese for its medicinal virtues, is found only in wooded districts, and is prepared exclusively for the Chinese market.

The plant is found in great quantities and exceedingly well developed in the Big Woods in this state, where it remained unnoticed except in the note-book of the botanist, till the fall of 1858, when a sudden impulse was given to its production, from some mysterious quarter, and the woods of the Minnesota river valley were filled with the eager crowd of ginseng diggers. This sudden movement in the production of an obscure plant, forms a singular episode in the commercial history of ginseng, and we are now fortunately able to explain the mystery of it.

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The trade in ginseng in this country has been controlled entirely for the last fifteen years by a single firm in Philadelphia, in whose warehouses the article is prepared and stored for the Chinese market. Twenty years ago the plant was obtained in Vermont, with a depot in Boston. Being exhausted in that locality, the Boston trade declined, or was transferred to Philadelphia, the root being now procured from Western Virginia and Pennsylvania. Sixty cents per pound was paid for it in its raw state, at the Philadelphia depot, a proof of its rarity. Familiar with the range of the plant and the resources of the localities where it was found, the dealers in the article contracted with a shrewd Virginian for all he could furnish. In a few months afterward, they were surprised at the receipt of enormous quantities, the root being of remarkable size and excellence. Accustomed to furnish it for the local as well as foreign market, they were soon after astonished to find extraordinary supplies of ginseng in the market from some mysterious quarter. The Philadelphia dealers endeavored to arrest a movement which threatened to ruin their trade, by buying up all the ginseng that was offered, at high prices. They paid as high as 90 cents for it, but could not exhaust the market nor discover whence the extraordinary supply came, until a detective force was organized, and the source of the repletion was traced to Minnesota. The Virginia contractor was found at the bottom of the movement. He had managed to obtain his ginseng from Minnesota at 6 to 8 cents per pound, and to sell it in Philadelphia for from 60 to 90 cents. For reasons which will suggest themselves, the shrewd contractor, in order to conceal the origin of his packages, found it necessary to disguise their contents and place of deportation, by frequent changes of marks. Hence, the actual quantities deported did not appear. One result of the operation was a thorough canvass of the state by an experienced agent of the Philadelphia dealers, and the discovery that the Big Woods contained large quantities of ginseng everywhere. The valley of the Crow River was found to be peculiarly rich in this plant, where it attained a remarkable growth. St. Peter was the principal depot of the Minnesota valley for the collection and preparation of this plant, and it was shipped chiefly from St. Paul and Hastings. The warehouse books at these points show a total deport of 203,000 pounds.

(5.) *Miscellaneous.*—The shipment of hides was reported in only four instances, wool in only two. We have no means of estimating the actual shipments of either. Besides these, numerous articles were reported in small amounts; butter, feathers, rags, seeds, vegetables, &c. The difficulty of obtaining the correct amounts lay in the fact that only a small portion of the enumerated articles are registered in the books of the regular warehouses, most of the shipments being made by non-resident dealers.

(6.) *Exports of Lumber.*—Although the lumber business has been in a state of very great depression, the reported exports for 1859, from St. Anthony, St. Croix valley and Wabasha, reached the following aggregates: See Table.

Sawed lumber,	46,000,000 feet.	Logs,	71,000,000 feet.
Laths,	21,886,000 "	Long timber,	9,490,993 "
Shingles,	6,763,000 "		

Small lots went from other towns, not reported. The lumber shipped from Wabasha was mainly received from the Chippewa river, Wisconsin.

(7.) *Exports of Furs.*—The exports of furs are estimated as follows:

St. Paul,	$120,000
Superior, north shore,	$40,000
Total,	$160,000

The furs received at St. Paul are collected from three different sources. (1.) From the Sioux of the Upper Minnesota. (2.) From the Chippewas of the Upper Mississippi. (3.) From Pembina and the British possessions, the latter being mainly buffalo robes. For details of the fur trade with the Red river valley, see Chapter I.

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(8.) *Average Prices of Produce at St. Paul in the Fall of* 1859.

	Oct. 1st.	Nov. 1st.	Dec. 1st.	Jan. 1st, 1860.
Wheat,	$0.52½	$0.62½	$0.54	$0.66
Corn,	.37½	.37½	.37½	.32½
Oats,	.22½	.22½	.22½	.23
Rye,	.35	.35	.35	.37½
Barley,	.32½	.32½	.32½	.37½
Potatoes, best,	.19	.27½	.25	.30
Butter,	.14	.17	.14	
Eggs,	.17½	.17½		
Flour,	3.37½	3.62½	3.62½	4.25

(9.) *Prices of Produce, for several years.*—The scale of prices maintained by the various staples for the several years, will be exhibited in the following table:

	Wheat.	Corn.	Oats.	Potatoes.
1851,		$0.25 *a* .30	$0.25 *a* .30	
1853,		.40 *a* .50	.40 *a* .60	$0.40 *a* .50
1855,	$1.00 *a* 1.50	.50 *a* .75	.40 *a* .75	.50 *a* .60
1857,	$1.25 *a* 1.50	.60 *a* 1.00	.75 *a* 1.00	.50 *a* 1.00
Spring of 1859,	1.00 *a* 1.26	.50 *a* .55	.50 *a* .55	.40 *a* .45
Fall of 1859,	.50 *a* .70	.30 *a* .40	.20 *a* .25	.18 *a* .30

The sudden overflow of production over consumption is shown by the abrupt decline in the prices after the harvest of 1859.

(10.) *Aggregate Value of the Surplus Product of* 1859.

Grain, exclusive of corn,	$1,850,000
Potatoes, vague estimate,	150,000
Lumber,	795,000
Furs,	160,000
Cranberries,	25,000
Ginseng, at 8 cents paid,	16,240
Hides,	35,000
Other articles, vaguely estimated,	150,000
	$3,181,240

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CHAPTER VII.

THE RAILROAD SYSTEM OF MINNESOTA.

(1.) *The Railroad Land Grant.*—By the Act of March 3d, 1857, the Congress of the United States granted to the Territory and future State of Minnesota, subject to the future disposal of the legistature, for the purpose of aiding in the construction of the lines of railroad described in the Act, every alternate section of land designated by odd numbers, for six sections in width on each side of said railroad lines, with the right of making up the full complement of 3,840 acres per mile, by appropriating lands outside the six mile limits, but within fifteen miles on each side. These indemnity sections, (as they are called,) must be selected from the lands nearest to the six mile limits, until the deficiency caused by previous sales or vested rights of pre-emptors, within six miles on each side of the roads, is supplied. The Government has decided that the right of a railroad company to which the State has transferred the grant of lands, is vested whenever the engineer has driven his stakes, definitely fixing any portion of the route.

(2.) *The Land Grant Railroad Routes and the action of the Legislature in relation thereto. Routes* 1 *and* 2.—"From Stillwater, by way of Saint Paul and Saint Anthony, to a point between the foot of Big Stone lake and the mouth of Sioux Wood river, [this point fixed by the Legislature of Minnesota is at Breckenridge,] with a branch via Saint Cloud and Crow Wing, to the navigable waters of the Red River of the North, at such point as the Legislature of said Territory may determine," and which has been fixed at Saint Vincent on the international boundary in latitude forty-nine. The Legislature on the 22d of May, 1857, organized the *Minnesota and Pacific Railroad Company*, and vested the lands granted in behalf of the foregoing main and branch lines in said company. The charter made Saint Anthony the point of junction between the main and branch lines, and included Anoka as a point on the route of the branch line.

Routes 3 *and* 4.—"From Saint Paul and from Saint Anthony, via Minneapolis, to a convenient point of junction west of the Mississippi, to the southern boundary of the territory in the direction of the mouth of the Big Sioux river, with a branch via Faribault, to the north line of the state of Iowa, west of range sixteen." The grant for the main line above described, was vested in the *Southern Minnesota Railroad Company*, (as now styled,) with a route "from Saint Paul and Saint Anthony via Minneapolis, to a point of junction at Shakopee City, in the county of Scott, and thence, via Belle Plaine, Clarksville, Le Sueur, Travers des Sioux, Saint Peter, Kasota, Mankato and South Bend, to the southern boundary of the Territory of Minnesota, in the direction of the mouth of the Big Sioux river;" while the branch from Minneapolis via Faribault to the south line of the Territory, crossing the Minnesota river near Fort Snelling, was entrusted to the Minneapolis and Cedar Valley Railroad Company, with the grant applicable thereto.

Route 5.—"From Winona, via Saint Peter, to a point on the Big Sioux river, south of the forty-fifth parallel of north latitude." This grant was transferred to the *Transit Railroad Company.*

Route 6.—"From La Crescent, via Target lake, up the valley of the Root river to a point of junction with the last mentioned road [Transit] east of range seventeen." This grant was transferred to the *Southern Minnesota Railroad Company.*

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(3.) *Lengths of the Land-grant Railroads.*—

1*st. The Projected Lines.*

Name.	Description.	From.	To.	Miles.
Minnesota & Pacific,	main,	Stillwater,	Sioux Wood river,	220
do.	branch,	St. Anthony,	St. Vincent,	400
do.	branch,	St. Paul,	Saint Paul,	1
Southern Minnesota,	main,	St. Paul,	S'n boundary of state in direct'n of mouth of Sioux Wood river,	165
do.	branch,	St. Anthony,	Shakopee,	25
Root river,	main,	La Crescent,	Rochester,	79
Minneapolis & Cedar valley,	main,	Minneapolis,	Iowa line, W. of R. 16,	112
Transit,	main,	Winona,	West'n boundary of state, S. of 45° North latitude,	268
			Total,	1,270

2*nd. As Surveyed and Located*, 1857. (State Records.)

Name.	Description.	From.	To.	Miles.
Minnesota & Pacific,	main,	Stillwater,	Point on Sioux Wood river, 7 miles S. of Breckenridge,	222
do.	branch,	St. Anthony,	Crow Wing,	116
do.	branch,	St. Paul, (N. limits of city,)	St. Paul. (bank of river,)	1
Southern Minnesota,	main,	West St. Paul,	R. line 31–32 of T. 107,	114½
do.	branch,	St. Anthony,	Junct'n 1 mile E. of Shakopee,	23½
Root river,	main,	La Crescent,	Rochester,	79
Minneapolis & Cedar valley,	main,	Minneapolis,	Iowa line, 3 m. E. of Cedar R.,	114
Transit,	main,	Winona,	R. line 31–32 of T. 110,	175
			Total,	845

(4.) *Outline of this System.*—This system does not provide for communication with the waters of Superior. A grant of lands was made in 1854 for this purpose, but was soon after repealed for a clerical irregularity. The grantees, however, still claim it, under a plea of vested rights, and the issue is in litigation in the Supreme Court of the United States. Undoubtedly the most important lines for the commercial development of the country are those which shall connect the waters of Superior and Red river with the waters of the Mississippi, the one furnishing Minnesota an outlet to the Atlantic, upon equal terms with Illinois and Wisconsin, (*see preceding chapter*,) and the other furnishing an outlet through Minnesota for the great north-western valleys of the Winnipeg, with the nucleus of a railroad to the Pacific, the root of a mighty system of interoceanic communication. (See Chapter I.) Adding to the land-grant system a road to Superior, we will have a total length of 1,420 miles of road, equal to one mile of railroad to fifty-seven square miles of surface. Ohio has one mile to thirteen and one-half square miles of surface. Massachusetts, one mile to five and four-fifths square miles. Illinois, one mile to twenty square miles. New York, one mile to seventeen square miles.

Of the projected land-grant lines, the main trunk of the Minnesota and Pacific, with its eastern terminus at Stillwater, will drain the commerce of the Upper Mississippi valley and develope the fertile plains of the Red river. A branch of this road from Minneapolis will traverse the wide and beautiful champaigns between the Minnesota and Mississippi. The Minnesota valley road will complete the fine natural communications of that district with the Mississippi, towards Lake Superior. The Transit, with its terminus at Winona, and the Root river, opposite La Crosse, will give the wheat districts of southern Minnesota, and the new territory of Dakota, an outlet towards Chicago. All these lines run in an easterly and westerly direction, but the whole system is knit together by the north and south line of the Minneapolis and Cedar Valley, connecting the pine regions of the north at the Falls of St. Anthony, the principal seat of lumber

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manufactures, with the naked prairies of the south, and pointing to the natural outlet of Minnesota upon Lake Superior.

(5.) *The Extent of the Land Grant.*

This extent of mileage, at the rate of 3,840 acres, (six sections of six hundred and forty acres each,) would make the aggregate railroad land-grant of Minnesota, now vested in the above named companies, 4,876,800 acres; but upon two of the routes designated, from La Crescent by the Root River Valley to Rochester, to be constructed by the Southern Minnesota Company, and the Faribault branch line to the Iowa boundary, to be constructed by the Minneapolis and Cedar Valley Company, there is a deficiency of lands.

The remaining routes, while submitting to deficiencies of lands near their eastern termini, are projected beyond the present line of settlement, and will thus be enabled within the thirty-mile belt (fifteen miles each way) to make up their full complements; although in Northern Minnesota, the title of the Minnesota and Pacific Railroad can not be perfected until the Indian title is extinguished east of the Red River of the North, and from the Wild Rice river to the international boundary.

The amount of lands to which each company will be entitled may be estimated as follows, using the ratio per mile assumed by J. W. Taylor, late secretary of the Minnesota and Pacific Railroad Company, in his report to the city council of St. Paul, upon the railroad system of Minnesota:

	Acres per mile.	Total.
Minnesota and Pacific Railroad,	3,840	2,384,640
Southern Minnesota Railroad,	3,840	729,600
Transit Railroad	3,840	1,029,120
Minneapolis and Cedar Valley Railroad,	1,339	150,000
Root River Railroad,	1.339	105,781
		4,399,141

The aggregate is less than the face of the grant by 477,659 acres.

The sanguine expectations excited by this liberal donation were suddenly cut short by the financial collapse of 1857, followed by the universal suspension of railroad enterprises in the west. In this emergency the railroad companies sought the aid of the state. Then followed a winter of active discussion, resulting in the submission of a constitutional provision authorizing the loan of state credit to the land-grant railroads. On the 15th of April, 1858, the amendment was ratified by a large popular majority

(6.) *Loan of State Credit to the Railroaa Companies by the State.*

For the purpose of expediting the construction of the land grant system of roads in Minnesota, a special issue of the bonds of the state was authorized, bearing interest at seven per cent. per annum, payable semi-annually in New York, and maturing on the 1st day of December, 1883, or twenty-five years from date. The amount issued to each company could not exceed $1,250,000, and the total issue was limited to an aggregate amount of $5,000,000.

These bonds were to issue as construction advanced, at the rate of $10,000 per mile of road completed ready for the superstructure, in sections of ten miles, and of $10,000 for every mile completed with the cars running thereon in sections of ten miles. To have exhausted the loan, therefore, it was necessary that sixty-two and one-half miles should have been completed and in operation by each company, or two hundred and fifty miles in all.

As a condition of this loan the companies were obliged, under penalty of forfeiting their lands, to complete the following lengths of road by the 1st of January, 1866:

	Miles.
Minnesota and Pacific,	320
Southern Minnesota,	188
Transit,	160
Minneapolis and Cedar Valley,	100
Total,	768

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(7.) *Results of this Policy.*—In pursuance of this law, $2,275,000 of state bonds were issued to the companies in the following amounts respectively:

To the Minnesota and Pacific Railroad Company,	$600,000
" Minneapolis and Cedar Valley Company,	600,000
" Transit Company,	500,000
" Southern Minnesota Company,	575,000
Making in all,	$2,275,000

These bonds were secured upon the assets and franchises of the companies. See "State Indebtedness."

The success of this expedient did not fulfill the promises of the railroad financiers, nor the expectations of the public. The banking law permitted these bonds to be received by the auditor as a basis for banking, and a considerable amount of currency was issued thereupon. Partly by this means and partly by enormous discounts to contractors they were made available for limited amounts of construction. But the palpable insufficiency of the guarantees for the prompt payment of the interest on the bonds, had made them from the first unacceptable to the financial public. Local quarrels fanned the general distrust. The currency based upon the railroad bonds was driven from circulation, and the bonds advanced from one stage of depreciation to another, till, in May, 1860, bank stocks of this class forfeited to the state were sold by the auditor for seventeen cents on the dollar.

Under these circumstances construction was unavoidably suspended upon all the roads. Default was made by all the companies except the Southern Minnesota in the stipulated payment of interest.

Their roads, lands, franchises, and other assets, are therefore confiscated to the state. The following amounts of graded road are among the assets to which the state is to look for its indemnification:

Number of Miles of Graded Railroad.

Name.	Description.	From.	To.	Miles.
Minnesota and Pacific,	Main,	St. Paul, (N. limits of city,)	St. Anthony,	8
do.	Branch,	St. Anthony,	Clear Lakes,	53 1-2
do.		St. Paul, (N. limits of city,)	St. Paul (bank of river,)	1
Southern Minnesota,	Main,	Mendota,	Belle Plaine,	37 1-2
do.	Branch,			
Root River,	Main,	La Crescent,	Two miles W. of Houston,	20 1-5
Minneapolis and Cedar Val.,	Main,	Minneapolis,	In disjointed sections,	69 1-4
Transit,	Main,	Winona,	Near Ashland,	50
			Total,	239 9-20

(8.) *Probable Railroad Development of Minnesota.*—From a pamphlet published by J. W. Taylor, Esq., of St. Paul, upon the railroad system of Minnesota, the following calculations are taken:

The population of Minnesota is 180,000. By the ratio of increase observed in the neighboring states, less than one-half its own past increase, the population of Minnesota in 1870 will be 1,000,000.

Massachusetts has one mile of railroad for each seven hundred inhabitants; Ohio, one mile to each eight hundred; and these results have been obtained without the aid of land grants. In 1838 the only railway in the United States was one of three miles in length, from the granite quarries at Quincy, Mass., to the tide-water of the bay: now we are operating 28,238 miles of railway—about one mile to every thousand of the population of the United States. This ratio, while less than in some states, it is safe to predict as the law of construction in Minnesota. With a population of 1,000,000 in 1870, Minnesota will have in operation 1,000 miles of railroad. Looking exclusively to the internal policy of Minnesota, excluding from view for the present the Pacific railway question, I would distribute the railway construction in 1870, as follows, viz.:

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	Miles.
From the St. Croix River to the Kandiyohi Lakes,	80
From the Falls of St. Anthony to a point on the Red River of the North, accessible by large steamers,	250
From the Mississippi River south of Anoka to St. Louis Bay of Lake Superior,	120
Minneapolis and Cedar Valley Line,	112
From St. Paul and St. Anthony south-westwardly to the Iowa border,	175
From Winona to the Western State Boundary south of latitude 45°,	200
From La Crescent, with branch lines through southern counties,	63
Total,	1,000

The extent to which these railroads would augment the resources of the state may be estimated from the effect of a similar policy in other states.

The railroad construction of Illinois and Ohio dates chiefly from 1850. The taxable property of Illinois from 1850 to 1855 increased from $105,432,752 to $334,398,425.

The valuation of property in Ohio stood thus at different periods:

In 1852,	$507,581,911
In 1858,	860,000,000
Increase,	353,000,000
Or an annual increase of	58,000,000

Tennessee, whose railroads were started in 1853 by a loan of state credit, has now eight hundred and seventy-five miles in operation. In 1857 the comptroller of the state reported that between 1854 and 1856 the increase of taxable property was $38,000,000, and that for 1857 the total increase would be fully $40,000,000.

Is it disproportionate to assume that the valuation of property in Minnesota in 1870 will be $350,000,000?

But Professor Mansfield, of the Cincinnati Railroad Record, cuts a more brilliant horoscope for the future of Minnesota than this.

The following table will exhibit the progress of railroads in the north-western states from 1852 to 1858:

	1852—Miles.	1858—Miles.
Ohio,	1,154	2,870
Indiana,	755½	1,782
Illinois,	296	2,643
Michigan,	427	804
Wisconsin,	50	776
Iowa,		436
Total,	2,682½	9,311
Made in six years,		6,642½
In each year,		1,100

with an average cost of $35,000 per mile.

Mr. Mansfield, from these statistics, estimates that in a few years the north-western states will have 16,000 miles of railroad, and sets down the share of Iowa and Minnesota in the year 1870 as not less than 4,000 miles, or 2,000 miles for Minnesota.

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CHAPTER VIII.

MANUFACTURES.

1. Physical Advantages for Manufactures.

In consequence of the peculiarities of its physical configuration, Minnesota possesses a remarkable hydraulic capacity for manufactures. There are but few counties in the state which have not abundance of water power. This is due to the elevation of the sources of all the tributary streams above the beds of the main rivers, and to the rapid and broken descent of the water line to the main trough of depression.

(1.) *Water Power in Northern Minnesota.*—The Mississippi originates at an elevation of 836 feet above the mouth of the Minnesota. In its descent from the summit level to this point, its water line is characterized by long steps of slack water broken at long intervals by abrupt transitions in the character of the rocks which form its bed, and forming a fine series of falls and rapids available for hydraulic works.

There are four of these on the main trunk of the Mississippi, Pokegoma Falls, Little Falls, Sauk Rapids and St. Anthony Falls, the latter being one of the most magnificent natural seats of manufactures on the continent. But the rivers of the eastern slope of the Mississippi originating in the highlands of Lake Superior, have a much more rapid descent than this; and, tumbling down the abrupt steps of their rocky beds, form numerous cascades and rapids.

The St. Croix Falls, formed by the termination of the trappean uplift upon the lower sandstone, is the most remarkable of these, rivaling the Falls of St. Anthony in hydraulic power and commercial value.

(2.) *Water Power in Southern Minnesota.*—The sources of the rivers which fall into the Mississippi below the Falls of St. Anthony and into the Minnesota river, are elevated usually about 500 or 600 feet above their mouths at an average distance of 50 or 60 miles on an air line from the latter, and probably twice that distance by their meanders, so that they fall almost 5 feet per mile of their course. This abrupt descent over broken beds of limestone through long and winding valleys, gives an unlimited abundance of available water power to the southern and central counties of the State.

(3.) *Steam Power.*—Notwithstanding this great abundance of water power, steam is employed in nearly equal proportions for reasons of local convenience, and its better adaptation to winter work. The use of steam in manufactures is however, necessarily limited in this state by the absence of coal.

(4.) *Commercial Basis of Manufactures.*—The use which Minnesota is to make of her immense water power, will form an interesting subject of future comment. It is impossible to overlook in this connection, the vast field of demand for the products of her manufacturing industry which is opening for the new future of Minnesota in the Northwest.* A broad commercial base of back country is an indispensable condition of eminence in manufactures, and this is the singular distinction of Minnesota among all the states on the western bank of the Mississippi. A territory of 500,000 square miles, including Minnesota, Dakota and Western British America, is dependent upon Minnesota for whatever of manufactured commodities it may consume, and it is the natural province of Minne-

* A striking proof of the influence of this wide market in promoting the success of manufactures in Minnesota, is afforded in the circumstance that an English company is said to be now negotiating for the purchase of an extensive interest in St. Anthony Falls, ostensibly for the purpose of manufacturing, on a large scale, articles of consumption in Rupert's Land.

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sota to supply these articles from the product of her own industry, as far as she has the raw material for the purpose.

(5.) *Resources of Raw Material.*—The facile relations of Minnesota with the cotton states and the growing wool development of the west, suggest obvious advantages for the class of textile manufactures now monopolized mainly by New England.

The mineral wealth of Lake Superior supplies the raw material, ready to hand, of the iron and copper manufactures of Pennsylvania.

Many of the forest trees most useful in the arts, manufactures and medicine, abound in her forests, which also yield to the axe and saw inexhaustible supplies of pine lumber.

We have already referred to the utility of the fine white quartzose sandstone of the Upper Mississippi for the manufacture of glass; to the exhaustless quarries of limestone which girdle the state, yielding at once a supply of building material adequate to all the demands of architecture and the lime necessary to its finish.

Not the least important of the indigenous raw material which Minnesota possesses for profitable manufactures, are the numerous salt-springs of the Red River valley; the beginning of the immense salines which stretch westward along the international boundary to the Rocky Mountains. These large reservoirs of salt, of which twelve belong to the state under a grant of Congress, are destined to form a considerable source of wealth. Reference has already been made, (see Chapter I.,) to the manufacture of salt in the British settlements of the Red River. A few years ago the supply of salt for these settlements was obtained in Northeastern Dakota, near Pembina. With the imperfect apparatus employed by the half-breeds who are engaged in its manufacture, the springs near Lake Manitoba are said to yield 1 bushel of good salt to 24 gallons of brine, or 33 1-3 per cent. The immense consumption of salt in the North-West in the packing of beef and pork, and other purposes, gives a peculiar value to this resource. In 1839 the Chicago market was supplied with 19,000 barrels. In 1858 there were imported into Chicago for the north-western trade, from the salt factories of New York alone, 1,669,000 bushels. The whole yield of the New York salt springs in 1858 was 7,033,000 bushels. There are also numerous salt springs in Virginia and Pennsylvania. Recently a valuable spring has been opened at East Saginaw, Michigan, yielding the same proportion of salt to brine as at Lake Manitoba. Nearly all the product of these springs goes to the supply of the North and of the North-West, which possesses in Minnesota and Dakota abundant resources for supplying itself.

2. Lumber Manufactures.

The resources of the lumber business in Minnesota, in the extent and character of the pine forests and deciduous woods, has before been described.

These lumber resources have a peculiar value from the immense stretch of prairie country to the west and south, including Southern Minnesota, Iowa, Illinois and Missouri, which must always be dependent upon the forests of Northern Minnesota and Wisconsin for their supply of pine lumber.

(1.) *Pine Lumber.*—It is a remarkable characteristic of the upper affluents of the St. Croix and Mississippi rivers, that in their rapid and broken descent from the highlands of the watershed, they intersect immense forests of pine, and thus afford an inexhaustible supply of timber, with a water-power adequate to its manufacture, and a ready access to the points most favorably situated for its fabrication and shipment.

(2.) *Lumber Districts.*—With reference especially to the business in pine lumber, the state is divided, (see page 264, Session Laws 1858,) into four lumber districts, as follows:

1st District. The St. Croix river and its tributaries.

2d. District. The Mississippi river and its tributaries between the mouth of St. Croix and Elk river.

3d District. The Mississippi river and its tributaries below the mouth of St. Croix river.

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4th District. The Mississippi river and its tributaries above mouth of Elk river.

[See Official Directory for Surveyors of Lumber.]

(3.) *Statistics of First Lumber District.*

The St. Croix Valley.—The weight of the lumber business of the state is in St. Croix valley, with its chief depot at Stillwater; the logs being obtained principally on the Kettle and Snake rivers, in Minnesota, and on the Wisconsin tributaries and the St. Croix from sixty to one hundred miles above Taylor's Falls. The Surveyor-General of lumber, for the first lumber district, including the St. Croix valley, reports the following logs scaled in his district in 1859.

Logs,	65,392,230 feet.
Logs unsurveyed, estimated,	5,000,000 "
Total,	70,392,230 feet.

The following Table indicates the number of Saw-Mills in this District, with their number of Saws and Quantities of Lumber cut in Ordinary Seasons.

Saw Mills in the First Lumber District.

Name.	Place.	Power.	No. Saws.	Am't cut per Annum.
Vasa,	Vasa,	Steam,	1	1,000,000 feet.
Marine,	Marine,	Water,	3	3,000,000 "
Arcola,	Arcola,	Water,	1	1,000,000 "
Mowers,	Arcola,	Steam,	2	2,000,000 "
Saint Louis,	Stillwater,	Steam,	40	15,000,000 "
Johnson's,	"	Steam,	11	4,000,000 "
Clay's,	"	Steam,	3	3,000,000 "
McKusick's,	"	Water,	2	2,000,000 "
Staple's,	"	Steam,	30	15,000,000 "
Nelson's,	Baytown,	Steam,	3	3,000,000 "
Bluff,	Lakeland,	Steam,	1	1,000,000 "
Perrin's,	"	Steam,	2	2,000,000 "
Ballard's,	"	Steam,	1	1,000,000 "
St. Anthony,	"	Steam,	23	10,000,000 "
St. Mary's,	St. Mary's	Steam,	1	1,000,000 "
Afton,	Afton,	Steam,	3	3,000,000 "
Grey Cloud,	Grey Cloud,	Steam,	2	2,000,000 "
Red Rock,	Red Rock,	Steam,	1	1,000,000 "
Wm. H. C. Folsom,	Taylor's Falls,	Steam,	2	2,000,000 "
Ansell Smith,	Franconia,	Steam,	1	1,000,000 "
20			133	73,000,000 feet.

Total, twenty mills, with one hundred and thirty-three saws, average annual product of 73,000,000 feet.

These are stated to be the ordinary results of lumber manufactures on the St. Croix in good seasons. In 1858 and 1859, however, in consequence of the depression in business, and the restricted demand for lumber, not more than one-half the amount was cut. The St. Croix Boom Company, chartered in 1856, with a capital of $25,000, transacts all the booming business of the St. Croix river. One of the St. Croix booms in Washington county employs in the log season from 150 to 200 men. The booming and rafting business at Stillwater, in an ordinary season, employs an average of 2,500 able bodied men. Probably not half that number were employed in 1859, for the reasons already stated.

(4.) *Statistics of Second Lumber District.*

Central Mississippi Valley.—St. Anthony Falls, the first in the magnitude of its local lumber manufactures, obtains its logs at a distance of from one to four hundred miles, on the upper affluents of the Mississippi, or the Rum river.

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Anoka, St. Paul, Hastings and other points, employ a few steam mills, but the chief depot of the lumber business for the Upper Mississippi is at St. Anthony Falls. The quantities scaled for this district are reported by the Surveyor General, as follows:

Logs, ... 29,382,000 feet.

The following Table exhibits the Mill Power in this District, employed in the Manufacture of Pine Lumber.

Place.	No. of Mills.	Power.	No of Saws.	Maximum quantity cut p'r. An.	Quantity cut in 1869.
St. Anthony Falls,	2	Water,	19	31,000,000	15,000,000
"	1	Steam,	4	6,000,000	4,000,000
Minneapolis, .	5	Steam,		15,000,000	7,000,000
" . .	2	Water,		8,600,000	2,900,000
Minnehaha, . .	1	Water,		2,000,000	1,000,000
Harrisburg, . .	1	Steam,		1,000,000	
Industriana, . .	1	Steam,		2,000,000	1,000,000
Champlain, . .	1	Steam,		2,000,000	
Anoka, . .	2	Steam,		no report,	
" . .	2	Water,		"	
Manomin, . .	1	Water,		"	
Mendota, . . .	1	Steam,		"	
Saint Paul, . .	4	Steam,		"	
West Saint Paul, .	2	Steam,		"	
Red Rock, . .	2	Steam,		"	
Grey Cloud, . .	1	Steam,		"	
Kaposia, . .	1	Steam,		"	
Pine Bend, . .	1	Steam,		"	
Hastings, . .	3	Steam,		"	

Total, eight water-mills, twenty-six steam-mills. Quantity cut in Hennepin county, 31,400,000 feet. In other counties, not reported.

(5.) *Statistics of Third Lumber District.*

Lower Mississippi.—The quantity scaled for this district was not reported. Wabasha, Reed's landing, and the towns at the mouth of the Chippewa—the outlet of the great Wisconsin pineries—receive annually large quantities of lumber and logs from this source, and all the saw-mills immediately on the Mississippi, are employed in the manufacture of pine lumber. We have no statistics of the manufacture of pine lumber in this district, except the following partial table.

Red Wing, two steam saw-mills; Central Point, two do.; Florence, one do.; Waconta, one do.; Wabasha, three do.; Reed's Landing, one do.; Tepeeotah, one; Minneiska, one do.; Lake City, two do.; Winona, three do.; La Crescent, one do.; Brownsville, one do. Total, nineteen. There are probably others not reported.

(6.) *Statistics of Fourth Lumber District.*

Upper Mississippi.—This district has not returned the quantities of logs scaled, but the quantity is doubtless small, from the great depression of the business. The following mills manufacture pine lumber: One steam saw-mill at Monticello; one at Silver Creek; one at Clearwater; one at Sauk Rapids; one at St. Cloud; one at mouth of Watab; one at Swan river; one at Belle Prairie; one at Fort Ripley; one at Crow Wing; one water-mill at Little Falls; one at Orono; in all twelve, and perhaps others. Most of the mills employed in making pine lumber are large, and will probably average twice the capacity of the mills engaged in making hard-wood lumber for local supply.

(7.) *Statistics of Hard-wood Lumber.*—In the manufacture of hard-wood lumber, from the deciduous woods that clothe the banks of streams on the western slope of the Mississippi, and furnish the building material used through-

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out the whole interior of the state, there are one hundred and fifty-six saw-mills employed in the reported counties.

3. Flour Manufactures.

Two years ago, Minnesota imported flour to supply the deficiencies in her own product. She has now probably one hundred and forty grist mills, one hundred and twenty-two being the sum of those actually reported to this office. Some of these mills are very large and fine, and the quality of flour produced rivals the best eastern brands.

4. Summary of Statistics of Manufactures.

The U. S. census of 1860 will furnish me the means of arriving at the capital employed and the product of the mills of Minnesota, in the next publication of this office. A considerable number of planing, sash, door, blind, plough and other factories are in operation in all the larger towns. Winona county boasts three whiskey distilleries. St. Paul, St. Anthony, Chaska, New Ulm, possess a number of lager beer breweries. The table in Appendix shows the results of our inquiries in relation to machinery. The incompleteness of the details with respect to capacity and product, compels me to omit these facts.

There are, according to this Table, in the thirty-four reported Counties.

Steam mills,	179
Steam engines,	187
Water mills,	164
Of which there are, saw-mills, steam,	86
" " " water,	136
Total number of saw-mills,	222
Grist mills, steam,	43
" water,	78
Total number of grist mills,	121
Total number of mills,	343

In the table XIII. but one woolen factory is noted, located at Preston, Fillmore county, quite adequate to the present wool product of the state.

5. Lime.

In default of more definite statistics, the abundance and facility of manufacturing lime in different counties, will be indicated by the fact, that it costs every where from twenty-five cents per bushel, in the most favorable, to fifty cents in the least favorable localities. Kilns are established in nearly all the counties which share in the limestone formation, and most of the lime used is of local manufacture. [See Chapter 2, for further remarks upon this topic.]

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CHAPTER IX.

MUNICIPAL STATISTICS.

1. Government.

1. *History.*—The Territory of Minnesota was established March 3d, 1849. The state of Minnesota was admitted into the Union on the 11th day of May, 1858, with two representatives, with the seat of government at Saint Paul. For the act authorizing the formation of a state government see document "A," of Appendix. The constitution was done in convention, August 29th, 1857, and adopted by the people October 13th, 1857, by a vote of 36,506 for to 703 against it. For the act of Congress admitting the state into the Union see document "B." For the members of Congress see "Official Directory."

Departments of Government.—The powers of government are distributed by the constitution into three distinct departments; legislative, executive and judicial.

(1.) *Legislative Department.*—The legislature consists of a senate and house of representatives. The senate representation can not exceed one member for every 5,000 inhabitants, nor the house one member for every 2,000 inhabitants. Its sessions are annual, commencing, according to the act of Aug. 10th, 1858, on the first Wednesday of December, and by an act of March 10th, 1860, proposing an amendment to the constitution, to be submitted to the people on Nov. 6th, 1860, the sessions are limited to sixty days. Under the provisional apportionment of the constitution the senate contained thirty-seven members, and the house of representatives eighty members. Under the new apportionment law, passed by the legislature of 1859–60, the senate is to contain twenty-one members and the house forty-two members. See apportionment law, document "D." For officers and members of last legislature see "Official Directory."

(2.) *Executive.*—The governor and lieutenant governor, elected by a plurality vote of the people, hold office for two years. A secretary of state, auditor, treasurer and attorney-general, are elected by the people, the auditor for three years, the others for two years. The offices of "superintendent of public instruction and of commissioner of statistics," were created by laws of the legislature of 1859–60, without salaries. See "Official Directory."

(3.) *Judiciary.*—The judicial power is vested in a supreme court, district courts, courts of probate, and justices of the peace. The supreme court consists of a chief justice and two associate justices. A reporter of its decisions is appointed by the court. Its terms are held once a year, at the seat of government. A clerk of the supreme court is elected by the people, who holds his office three years. There are six judges of district courts, elected one in each judicial district, holding for seven years. A clerk for each district court is elected once in four years. Probate judges are elected in each county for two years. Justices of the peace are elected for two years. For existing officers, with their salaries, and places, and times of holding court, see "Official Directory." See "Judicial Districts."

2. Civil Divisions.

1. *Counties.*—Minnesota contains sixty-nine counties, embracing its whole area except about 1,700 square miles of nameless fragments. For the areas of counties, see Table 2. In a state like Minnesota, generally uniform in elevation and homogeneous in surface forms, without bold natural lines of sub-division,

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it would not have been difficult to have blocked out its surface into counties of nearly equal dimensions, and, for three-fourths of its area, with a nearly equal capacity to sustain population. Public policy and convenience, and, indeed, public justice, require that the subordinate municipalities should be, as far as the nature of the country will permit, upon this equal footing. The expenses of county governments being the same, the resources from which their support is derived ought to be made as nearly equal as possible. This obvious principle has not been regarded in the legislation which has been had on the subject of county divisions. Great disparities exist in the areas even of the organized counties as at present distributed. The boundaries of unorganized counties are not yet permanently adjusted. It is to the organized counties that attention is directed. By inspecting the table it will be seen that while Fillmore has 864 square miles Scott has but 375, Ramsey, 156, and Manomin, 16. The last example is especially absurd. The constitution provides that no new county shall contain less than 400 square miles. The wisdom which dictated this judicious provision might employ itself beneficially in revising the last mentioned relic of territorial legislation. With its present sparse population it is too small for any form of county organization, and should be attached to one of the adjacent counties. The table of areas is as nearly correct as the confusion and discrepancies of legislation, in many cases, upon county boundaries would permit.

2. *Extension of Organized Settlement.*—The progress of settlement in Minnesota is graphically illustrated by the following abstract of legislation in the division and organization of counties:

1849.—1 organized county, St. Croix, being that portion of the territory partitioned from Wisconsin, on the east side of the Mississippi, and embracing all the ceded lands in the state.

1850.—3 organized counties, Washington, Ramsey, Benton; 6 unorganized, Itasca, Dakota, Wahnatah, Mahkato, Wabasha and Pembina; 9 counties in all.

1851.—3 organized counties, same as in 1850, and a new division of the unorganized territory into 6 counties, Dakota, Itasca, Cass, Pembina, Chisago and Wabasha; 9 in all.

1852.—5 organized counties, adding Chisago and Hennepin; 5 unorganized; 10 in all.

1853.—13 organized counties, including eight organized from the just ceded Sioux territory, *viz.:* Dakota, Wabasha, Fillmore, Scott, Le Sueur, Blue Earth, Nicollet, and Pembina, and 5 unorganized, *viz.:* Pierce, Sibley, Rice, Goodhue and Itasca; 18 counties in all.

1854.—18 organized, adding Sibley, Rice, Goodhue, Houston and Winona, and 5 unorganized as above; 23 counties in all.

1855.—21 organized counties, adding Stearns, Carver, Wright, and 15 unorganized, *viz.:* Olmstead, Dodge, Mower, Freeborn, Faribault, Steele, Renville, Davis, Brown, Todd, Pierce, Itasca, Pembina, St. Louis, and Martin; 36 in all.

1856.—34 organized, adding Todd, Faribault, Mower, Morrison, Sherburne, Brown, St. Louis, McLeod, Meeker, Olmsted, Dodge and Steele, and 8 unorganized, adding Pine and Lake.

1857.—50 organized counties, adding Isanti, Waseca, Aiken, Mille Lac, Buchanan, Carlton, Crow Wing, Manomin, Anoka, Freeborn, Pine, Itasca, Martin, Jackson, Nobles and Big Sioux, mostly new sub-divisions, and 13 unorganized counties, adding Pipe Stone, Cottonwood, Murray, Rock and Medway.

1858.—61 organized counties, adding Monroe, Otter Tail, Breckenridge, Toombs, Becker, Kandiyohi, Polk, Douglas, Monongalia, Wadena, newly created, and 7 unorganized counties.

The counties described as organized are those declared organized by legislative act, or organized by the appointment of commissioners. The organization in many of these cases was merely nominal, and was never consummated in fact.

3. *Township Subdivisions.*—In 1859 the counties were reorganized on the basis of township sub-divisions, with township and county governments. The following counties were organized under the township law.

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Table showing the Counties organized with Township Subdivisions.

	No. of towns.		No. of towns.
Anoka,	8	McLeod,	10
Benton,	5	Meeker,	8
Blue Earth,	13	Morrison,	4
Brown,	9	Mower,	10
Carver,	11	Nicollet,	9
Chisago,	6	Olmsted,	16
Crow Wing,	1	Pine,	3
Dakota,	20	Ramsey,	9
Dodge,	12	Rice,	15
Faribault,	9	St. Louis,	5
Fillmore,	22	Sherburne,	5
Freeborn,	18	Sibley,	9
Goodhue,	21	Stearns,	10
Hennepin,	19	Steele,	13
Houston,	16	Scott,	11
Isanti,	7	Todd,	5
Jackson,	3	Wabasha,	18
Kandiyohi,	3	Waseca,	8
Kanabec,	1	Washington,	12
Le Sueur,	16	Winona,	20
Martin,	3	Wright,	13

Whole number of organized counties, 42. Whole number of townships, 436

Under the law of 1858, each township elected three supervisors, composing the township board. The chairmen of these town boards composed the county boards of supervisors. This system required, therefore, a total township legislature, if it may be so called, of 1,308 members, of whom 436 members were represented in the various county boards, or an average of ten members to each board, in session in some counties a dozen times a year. The legislature of 1859–60 wisely abolished this cumbrous apparatus and committed the management of county affairs to five commissioners in each. The whole number of counties organized under the present system is forty-four, including all the counties in the above list and the counties of Manomin and Mille Lacs in addition. The whole number of commissioners in these counties is, therefore, 220.

Miscellaneous.—For the *County Seats* and the *County Officers* of the several counties, see Official Directory.

For the *Areas of the Counties* and the *proportions* of woodland and prairie they contain, see Table II.

For the assessed valuation of Real Estate and Personal Property for 1859, in the several counties, and the taxes assessed thereon, see Table XV.

For the Progressive Increase of Wealth in the several Counties, see Table.

For description of their Topographical features, the Counties are grouped in hydrographical subdivisions in Chapter II., to which the reader is referred.

The other classes of County Statistics, which are exhibited in the Appendix, will be found indexed.

4. *Congressional Districts.*—The state constitutes one Congressional District, electing two members of the House of Representatives of the United States. See Official Directory.

5. *State Electoral Districts.*—The provisional apportionment of the Constitution created 26 Electoral Districts, from which 37 Senators and 80 Representatives were elected to the State Legislature. Under the Apportionment Law of February, 18th, 1860, the number of Districts was reduced to 21, and the representation to 21 Senators and 42 Representatives. For the counties comprising the several Districts and the representation allotted to each, see Document "D" Appendix.

6. *Judicial District of the United States.*—The State constitutes one Judicial District of the United States. For Judge and Clerk and places and times of holding Court, see Official Directory.

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7. *Judicial Districts of the State.*—The state is divided into six Judicial Districts, as follows:

1*st District.*—The counties of Washington, Chisago, Manomin, Anoka, Isanti, Pine, Buchanan, Carlton, St. Louis and Lake.

2*d District.*—County of Ramsey.

3*d District.*—Houston, Winona, Fillmore, Olmsted and Wabasha.

4*th District*—Hennepin, Carver, Wright, Meeker, Sherburne, Benton, Stearns, Morrison, Crow Wing, Mille Lacs, Itasca, Pembina, Todd and Cass.

5*th District.*—Dakota, Goodhue, Scott, Rice, Steele, Waseca, Dodge, Mower, and Freeborn.

6*th District.*—Le Sueur, Sibley, Nicollet, Blue Earth, Faribault, McLeod, Renville and Brown.

For Judges and times and places of holding Court, see Official Directory.

8. Population.

1. *Progress of Population.*—The census of 1860 will enable me to exhibit the full details of the movement of population in Minnesota. At present, general results must suffice.

The following table exhibits the growth of population for ten years, within the limits of the present state:

Year.	Authority.	Number.
1849,	Territorial Census, June 11th,	4,049
1850,	United States Census,	6,077
1857,	Census preliminary to admission,	150,037
1859,	Estimated on basis of October vote,	175,000

2. *Increase of Vote.*—The following table exhibits the increase of the vote at the General Elections for Senatorial and State officers.

	No. of Votes.	Ratio of increase per cent.
August, 1847,	682	
September, 1851,	1,208	
October, 1853,	2,845	133
October, 1855,	7,944	282
October, 1857,	35,340	445
October, 1859,	38,917	10

Up to 1857, the table includes the vote of the present territory of Dakota.

3. *Ratios of Increase.*—The table of population shows a ratio of increase of 56 per cent. yearly, from 1849 to 1857. The table of votes shows an increase of 60 per cent. yearly, from 1851 to 1855, and of 112 per cent. from 1855 to 1857, indicating the fact that it was the period between these two years in which the chief immigration to Minnesota took place.

In the years immediately following 1850, the gold discoveries of California diverted immigration from the north-west, and the fact that until 1853 the whole of that portion of the territory of Minnesota west of the Mississippi river was in the occupancy of the Dakota Indians, effectually excluded population from our borders.

Assuming the population of 1859 at 175,000 on the basis of the proportion between votes and population in 1857, the decennial ratio of increase from 1849 to 1859, would be over 43 fold, or 3,322 per cent., a more rapid growth in population than is exhibited in the record of any state in the Union. Indeed, no other state approaches Minnesota in this respect, as the following comparison, exhibiting the *most rapid growth* of the *most rapidly growing* states, in the *most rapid period of their growth*, will show:

	Rates of Increase per cent.
Minnesota, from 1849 to 1859,	3,322
Wisconsin, from 1840 to 1850,	891
Iowa, from 1840 to 1850,	347
Michigan, from 1830 to 1840,	575
Ohio, from 1800 to 1810,	408
Indiana, from 1810 to 1820,	510

Minnesota, by this showing, has grown four times faster in the last ten years

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than the most rapidly growing state of the Union, in the most rapid period of its growth; eight times faster than the average of the fastest states, and one hundred times faster than the average increase of the whole Union.

4. Increase of Wealth.

(1.) *General Increase.*—A table exhibiting the progress of prosperity in the several counties since 1849, is given in the Appendix, but it has little value for purposes of local comparison on account of the numerous changes in the boundaries and dimensions of counties. Unless these are taken into account, the following table shows the general increase of property since the organization of the Territory, with the number of counties assessed, and the population of the whole State, the latter being the census enumerations for the years 1849 1850 and 1857, and estimated from the popular vote for the rest:

Table showing the Growth of Property in ten Years.

Year.	No. of Assessed Counties.	Valuation.	Ratios of increase per cent.	Population.
1849,	1	514,936	—	4,049
1850,	6	806,437	56	6,077
1851,	3	1,282,123	59	7,000
1852,	8	1,715,835	33	10,000
1853,	6	2,701,437	51	14,000
1854,	13	3,508,518	29	32,000
1855,	18	10,424,157	197	40,000
1856,	24	24,394,395	134	100,000
1857,	31	49,336,673	102	150,037
1858,	37	41,846,778	15*	160,000
1859,	40	35,564,492.70	15*	175,000

The table shows an average increase in the assessor's estimates of property in Minnesota, up to the date of its state organization, of 82.6 per cent. yearly, against an increase in population of 56 per cent. yearly. The decrease in 1858 and 1859, was a natural result of the commercial revulsion of 1857, of the dissipation of the fictitious value of real estate, and of the new adjustment of values in all kinds of property. The appraisements, however, made at a period of great depression, are undoubtedly much below the actual value of the assessed property. The increase for the whole decade is 6746. per cent., or more than 57 per cent. compounded yearly. In proportion to population, the assessor's valuation of property is equivalent to $200 per capita. In 1849, it was $128 per capita, an increase of 56 per cent. in the average individual wealth of the people.

(2.) *Increase of the Principal Counties in Wealth.*

The following Table shows the Increase of some of the Principal Counties in Wealth, since the organization of the State.

Year.	Ramsey.	Washington.	Hennepin	Winona.	Fillmore.
1849,					
1850,	477,334	228,860			
1851,	782,113	335,172			
1852,	1,060,818	343,758	43,525		
1853,	1,783,375	438,723	59,363		
1854,	2,975,510	699,256	157,281	61,021	
1855,	4,544,117	1,362,854	505,781	252,930	355,889
1856,	5,856,620	1,938,648	3,459,312	1,946,262	963,000
1857,	9,432,562	3,021,599	6,814,706	3,021,718	1,591,000
1858,	5,685,370	1,827,192	6,064,152	3,142,681	1,785,035
1859,	6,834,534	2,290,193	3,654,169	2,125,953	1,558,487

Ramsey county shows an average ratio of increase of 51 per cent. yearly, up to 1857, for eight years. Washington county, 38 per cent. yearly, for eight years. Hennepin county, 251 per cent. yearly, for six years. Winona, 358 per cent. yearly, for four years, and Fillmore, 118 per cent. yearly, for three years. The whole increase of ten years in Ramsey, 1332 per cent.; in Washington,

* Indicates decrease.

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904 per cent.; in Hennepin, for seven years, 8300 per cent.; in Winona, for six years, 248, and Fillmore, for five years, 336 per cent. It must be remembered that Ramsey county, during the interval represented, was reduced from an area of several thousand square miles, to 156 square miles, and that a valuable portion of the county, embracing St. Anthony and its environs, was cut off in 1856-7, and attached to Hennepin. Want of space makes it necessary to postpone a full exhibit of all the counties. For the period after 1857, which exhibits a decrease in valuation throughout the state, see Chapter XII. upon the effects of the commercial revulsion of 1857.

(3.) *A State Board of Equalization.*—The appraisements of property throughout the state are presumed to be based, generally, on a *cash* valuation, which is, of course, placed a good deal below the *selling* price. But land is sold for cash only in so few instances, that the actual cash value can not be determined by any recognized standard. The consequence is, that the appraisements of property have a margin of at least fifty per cent. between what is assumed as the lowest and the highest cash value, within which the appraisements of the assessors are purely arbitrary, and hence there is frequently a great difference in the standard of valuation assumed by the assessors in different counties. To present the valuations of four or five agricultural counties nearly homogenous in situation and physical features, in relation to population, and agricultural product.

	Area.	Vote 1859.	Estimated Grain Product.	Assess'd Val'n 1859.
Fillmore,	864	2,752	1,000,000 bushels.	$1,558,487
Rice,	516	1,878	695,000 "	1,398,632
Olmsted,	660	1,896	695,000 "	1,244,970

Fillmore, upon the basis of Rice county, should have been appraised at $2,000,000. There is no reason that property in Rice or Olmsted should be appraised at a higher rate than in Fillmore, yet it seems, from the above comparison, to be so. The returns to be sent to this office under the tax law of 1859, embracing nearly all the elements of value, will enable the "State Board of Equalization," established by the same law, to correct the inequalities in the appraisements.

4. Taxation.

To re-produce the complicated apparatus of civilization in the wilderness, and in a single decade to transport the institutions of opulent and populous communities to a new and sparse settlement, ought, it would seem, to require a large expenditure, implying a heavy tax upon the profits of industry. Schools, roads, bridges, railroads, canals, are among the useful objects of expenditure which the first generation is required to bequeath, completed, and unburdened to the next. With all this social and commercial capital to create anew, it is not wonderful that nearly all the young states of the west have had to pass through periods of great fiscal embarrassment. Yet the taxes in Minnesota, for these objects, are not heavy, taking into the account the extremely low valuation of property, and are even light as compared with other western states at the corresponding period of growth. The average rate per cent. on one dollar valuation of the different classes of taxes levied in this state for 1859, are as follows, reports being had from twenty-eight counties.

State tax,	5 mills.
School tax, fixed by law, at	2½ "
County tax, average in twenty-five counties,	7½ "
Town and road tax,	2½ "
Average rate of taxation for the whole state,	17½ "

Of this, the aggregate tax for local purposes, mostly self-imposed by the towns and counties, for county and town expenses, schools and roads, amounted to 12½ mills on the dollar, or 71 per cent. of the whole tax. Applying the averages deduced from the reporting counties, to those from which no report was received, we have the following result, showing the amounts of different classes of taxes for 1859, in the state at large:

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Amount of state tax,	$177,822.43
" of school tax,	88,961.21
" of county tax,	266,883.63
" of town and road tax,	88,961.21
Total amount of all taxes levied for 1859, except city taxes,	$622,628.48

The following is a concise classification of these results:

State tax at 5 mills on $1,	$177,822.43
Local taxes, 12½ " "	440,701.91
Whole tax,	$622,628.48

The local tax being 71 per cent. of the whole. The large proportion of expenditure for local purposes is the most significant feature of this record. This heavy local tax of 1859 arose from the unwise and premature institution in 1859, of a cumbrous and complicated system of township and county government, which went generally into operation in 1859, but which was very much modified and simplified by the legislature of 1859–60, and the expenses of county government reduced, it is said, over fifty per cent. See Sec. 2.

(2.) *Comparison of Taxation with other States.*—It is nearly impossible, from any public records, to ascertain the amount of taxes levied in different states for county, town, road and other local purposes. By direct inquiry of the authorities of some states, and the published records of others, I am able to make the following comparison of the ratios of taxation for all purposes, except city taxes, in a few prominent cases.

	No. of Mills on $1 Valuation.
Whole rate of taxation in Minnesota,	17½
Nominal rate in Iowa, relative to appraised value,	11
Actual rate at the Minnesota standard of value, about	20
" " in Ohio,	12
" " in Indiana,	7⅔
" " in New York,	10.98

In regard to Iowa, the laws of that state allow a maximum for state tax of three mills; county tax, six mills; school tax, two and a half mills; road, three mills; bridges, one mill, or fifteen and a half mills in all; beside which, the school law allows a special school tax. The Auditor of that state informs me that the average rates per dollar, in the several counties, exclusive of city tax, would probably fall between eight and eleven cents. On the other hand, the assessed valuation of property in that state is maintained, nominally, at the appraisement of 1857, while its market value has fallen nearly fifty per cent. So that the actual tax relatively to the real value of property, is higher than in Minnesota. Considering the small population of Minnesota, the immense area over which it is distributed, and the complicated machinery of township and county government which was carried on in 1859, the comparison can not be considered unfavorable to Minnesota. The simplification of the county governments will considerably reduce the taxes for 1860, and as the property basis expands, the ratio of taxation will, of course, rapidly decrease.

(3.) *Relative Capacity of the Community to Sustain Taxation.*—Whether taxes are to be considered burdensome or light—as an obstacle or an aid to prosperity—depends upon these conditions:

1. Upon the ratio of the tax imposed to the property of the tax-payer, and
2. Upon its ratio to the income of the tax-payer.

And the income of the tax-payer comes ordinarily from these sources:

1. From the exchangeable product of the labor and skill bestowed upon his property.
2. From the permanent increase in the value of his property occasioned by the general growth of the country.
3. From the permanent increase in the value of his property created by his own labor.

Taxes, for reasons before given, are necessarily in a greater ratio to property in new and thinly-settled communities than in populous ones.

In Ohio, as late as 1845, taxes were sixteen and seven-tenths mills on $1 valu-

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ation. In California in 1857, *the state tax alone* was sixty mills, or six cents on $1. In Texas *the state tax alone* is now twelve and one-half cents on the dollar. But these taxes are but little felt at these early periods of growth, because the income of the tax-payer relative to the assessed value of his property is much greater at these early periods than at any other.

Thus the exchangeable product of the industry of Minnesota yielded nearly the following gross results in 1859:

Grain and potatoes,	$4,500,000
Lumber,	850,000
Other articles,	250,000
	$5,600,000,

equivalent to fifteen per cent. on the whole property valuation of the state.

From 1849 to 1859 the wealth of the state increased 6.746 per cent., and the individual wealth of the people from $128 to $220 per capita, equivalent to 5.6 per cent. annual increase in the permanent wealth of the tax payers.

Under these circumstances taxes in Minnesota can not be regarded as disproportionate to the resources of the people, while on the other hand it is equally obvious that the taxes can not be increased without becoming a sensible burden. In a few counties this is already the case. The highest tax in any one county is thirty mills. In New York in 1859, Hamilton county paid the highest tax, or twenty-seven mills.

With this record before it the legislature will be able to act intelligently and decisively in relation to the proposed policy of assuming the credit bonds issued to the defaulting railroad companies, and amounting to $2,275,000 as an immediate burden upon her treasury. The interest on this sum is $159,250, equivalent to a tax of four and one-half mills upon the present valuation, increasing the state tax to eight and one-half mills and the tax for all purposes to twenty-two mills on the dollar, or over two per cent. of the whole property valuation.

(4.) *State Tax Compared with other States.*—The state tax of Minnesota is levied solely for the expenses of government and to pay interest on the debt incurred for expenses of government. The ordinary expenses of the state government are much too high, if the ratio of expenditure in other states is assumed as a guide.

Minnesota paid in 1858 and 1859 for the support of her state government, five mills on the dollar; in 1860, four mills; Wisconsin, 1859, one and two-fifths mills; Iowa, 1859, one and one-half mills; Michigan, 1859, one mill; Texas, twelve and one-half cents. But on the other hand it requires nearly the same central machinery of government in a state with a small, as in one with a large population.

The ordinary annual expenses of government in Minnesota for 1858 and 1859 were $149,594.33, exclusive of the interest on her public debt. The like current expenses of Iowa, exclusive of the public debt, are $274,145; of Wisconsin, $285,000. As to economy of government, the result is favorable to Minnesota, and will appear still more so under the system of retrenchment now in operation.

(5.) *Decrease in Taxation.*—The gradual decrease in the absolute state tax will be seen from these figures:

Ratio of state tax on valuation of 1857,	$246,683.36
State tax of 1858,	209,233.89
State tax of 1859,	177,822.43
Estimated for 1860,	140,000.00

The whole appropriations for all expenses incurred or to be incurred in 1860 amount to $137,233.11.

(6.) *Delinquent Tax.*—The delinquent taxes due from all the counties up to December 1st, 1859, amount to $149,790.67 for several back years, against an assessment of $177,822.43 for 1859. In Iowa the delinquent tax due the state on November 7th, 1859, was $293,122.10, against an assessment of $296,734 for 1859, showing that taxes are better paid in Minnesota than in Iowa.

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5. Finances of the State.

Receipts and Expenditures.—From January 1st, 1858, to December 1st, 1859, the appropriations made amounted to $416,797.08; warrants drawn without appropriations, $5,575.16; total, $422,372.24. Of this, warrants were drawn for $363,682.89, leaving an unexpended balance of $58,689.40. The net receipts and disbursements for the same period were as follows:

Receipts.

From state scrip issued,	$183,597.07
" sale of eight per cent. bonds,	252,512.50
" territorial and state taxes,	116,446.92
" W. J. Cullen, superintendent of Indian affairs,	5,250.00
" H. H. Sibley, court reports sold,	12.00
" balance in treasury, January 1st, 1858,	5,009.43
Total receipts,	$562,827.92

Disbursements.

For payment of legislative certificates,	$92,608.15
" " constitutional convention certificates,	50,353.07
" " territorial warrants,	64,626.01
" " state warrants,	142,793.40
" " principle and interest of state scrip,	192,108.13
" " to St. Peter Company,	5,000.00
Balance in treasury December 1st, 1859,	15,339.16
	$562,827.92

The balance in treasury is here stated at $15,339.16. Of this amount $14,325.00 was invested in fifteen Minnesota seven per cent. bonds, and set apart as a sinking fund, leaving the amount subject to draft, $1,014.16. The precise share due to 1858 can not be ascertained from the report. I have obtained the following statements from the auditor of the finances of 1859 and the appropriations of 1860:

Receipts, 1859.

Taxes,	$94,780.43
Received from W. J. Cullen, superintendent of Indian affairs on account of expenses of Inkpatutah affair,	5,250.00
	$100,030.43

Expenditures.

Judiciary,	$22,500.00
Legislative,	
Executive,	19,500.00
Public printing,	15,000.00
Contingent funds,	5,000.00
Penitentiary,	4,000.00
Interest on public debt,	20,500.00
Miscellaneous,	2,000.00
	$86,000.00

Appropriations, 1860.

Judiciary,	$18,000.00
Legislative,	50,000.00
Executive,	10,850.00
Public printing,	18,010.00
Contingent funds,	2,990.00
Penitentiary,	2,100.00
Interest on public debt,	22,200.00
Miscellaneous,	13,083.11
	$137,233.11

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State Debt.—Three classes of state indebtedness exist in this state:

(1.) A bonded debt of $250,000, the limit originally prescribed by the constitution. This debt was authorized by a law approved March 13th, 1858, to pay off old territorial and other liabilities, and the current expenses of the fiscal year, commencing Dec. 2d, 1857, and bears an annual interest of eight per cent. The law requires the principal of this loan to be paid in nine years, a sinking fund being created for that purpose by annual tax. See Table of State Bonds, in Appendix.

(2.) A floating debt, estimated by the governor, for Dec. 31st, 1859, at $80,000, the whole amount actually covered by outstanding treasury scrip, being $35,970.65.

(3.) A contingent liability incurred by a loan of state credit to aid in the construction of railroads, amounting to $2,275,000, in bonds of the state, bearing interest at seven per cent. per annum, and which mature on Dec. 1st, 1883, or in twenty-five years from date of issue. See Table State Bonds. These bonds were issued to the four land-grant companies, by virtue of an amendment to the constitution, adopted by the people April 17th, 1858, as a part of a loan of $5,000,000, to have been issued as construction advanced. See chapter on Railroads. These bonds were distributed in the following amounts to the several railroad companies:

To Southern Minnesota Railroad Company,	$575,000
" Minnesota and Pacific,	$600,000
" Transit,	$500,000
" Minneapolis and Cedar Valley,	$600,000
Total,	$2,275,000

All these companies, the "Southern Minnesota" excepted, have defaulted in the payment of the interest upon their bonds. By the terms of the loan the state was intended to be exonerated from the payment of any part of the interest or principal of these bonds, and for this purpose the state was secured by the trust deeds and other instruments of the companies, covering the following securities in case of default, the companies in that case forfeiting the right to receive any more state bonds:

1. The entire nett profits of the roads.

2. The conveyance to the state, by each company, of the first 240 sections or 153,600 acres of land, free from prior encumbrances, which may enure to them respectively, under the terms of the land-grant. The Minnesota and Pacific, deeming itself entitled to 240 sections under their construction of the grant, transferred that amount in their trust deed. The other companies, considering that the grant conferred an existing right to but 120 sections, or such a part thereof as could be found on any twenty mile section on the line of their surveys, transported their amounts respectively. The lands thus conveyed in trust to the state are estimated as follows:

Minnesota and Pacific,	153,600 acres.
Southern Minnesota, 1. for the Minnesota valley line,	76,800 "
2. For the Root River line,	26,780 "
The Transit,	76,800 "
Minneapolis and Cedar Valley,	26,780 "
Total,	360,760 acres.

3. *The First Mortgage Bonds* on all their lands, roads, franchises and other assets, equal to the state bonds delivered. This, by a decision of the supreme court, is not an exclusive lien but a concurrent security, except in the case of the Minneapolis and Cedar Valley Railroad Company, which has made it an exclusive lien, by the terms of their trust deed. The trust deeds empower the governor, (on the trustees neglecting or refusing,) to foreclose these securities, which have been forfeited by the defaulting companies. An act of the legislature makes it the duty of the governor to sell their roads, lands, franchises, &c., on the refusal of the trustees to do so when requested by the governor, and also authorizes him to bid off the property of the roads at such sale on behalf of the state, and to execute the instrument of conveyance therefor.

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The trustees of the Minnesota and Pacific and of the Transit companies having neglected to commence foreclosure, the governor has advertised the property of the companies for sale on the 23d of June, 1860. In the case of the Minneapolis and Cedar Valley Co. the trustees have agreed to foreclose of their own will. We have no means of ascertaining to what extent these securities will indemnify the state for the obligations it has incurred for the railroad companies.

County Finances.—Table VII exhibits the general finances of the counties. There is some confusion in the reports, especially in the item of indebtedness, some of the auditors having given the excess of liabilities over assets instead of the whole liabilities, as the debt of their counties. Reports from twenty-five counties give the following results:

Amount of annual expenditures,	$160,176.19
Amount of county orders issued,	$163,597.82
Amount of county orders outstanding, Jan. 1st, 1860,	$125,183.79
Total debt of the twenty-five counties,	$288,462.83
Total delinquent taxes unpaid Jan. 1st, 1860,	$286,566.37

This statement exhibits some obvious discrepancies in the auditors' reports, but the following deductions are to be made from it:

1. That the current expenditures of the counties are uniformly covered primarily by county orders, issued in anticipation of their regular revenues, and constituting a floating debt. Now the whole county tax for 1859 being about $267,000, the inference is that this closely represents the whole expenditures for that year. We have, therefore, an annual issue of about $267,000 of depreciated paper currency in constant circulation. I have tried to ascertain the current rates of these county orders but without success.

2. The debt of the above counties over the amount expressed in county orders is $163,279.00. By reference to the table of county bonds it will be seen that a large proportion of this amount is covered by issues of bonds, bearing interest at from ten to twelve per cent.

3. The liabilities of the counties are nearly offset by their resources in delinquent taxes. A reference to the table will show that only seven of the reporting counties will have to depend upon future taxes to pay off their debts. See appended Table of *County Bonds.*

Civic Growth of Minnesota.—Towns are developed primarily as depots of commercial exchange, and, secondarily, for convenience of commercial exchange, they become centers of manufacturing industry. Both these interests are reciprocally subservient to the agricultural population and dependent upon it. In a community, the principal staples of whose production are agricultural, a healthy distribution of employment would give about one third of the population to commerce and mechanical and other dependent pursuits, in other words to towns and cities. Towns are not found to flourish permanently beyond this proportion.

The census of 1860 will furnish materials for determining the precise status of the cities and towns of Minnesota, which it is now impossible to obtain. We have the assessors' estimates of property, but these are an unreliable measure of growth without the element of population. If the census had been taken in 1857 it would have shown an excessive overgrowth of property in town lots and of population in the cities and villages. One of the most conspicuous and happy effects of the revulsion of 1857 was the transfer of population from towns and villages to rural occupations; a constant increase of the rural population, with a general decrease of the civic. As a consequence of this new distribution, enforced by the necessity of remunerative employments, we may infer that the town population has settled down to its legitimate proportions. This would give a population in the cities, towns and villages, of about 60,000.

Notwithstanding the temporary subsidence of the civic overflow of 1857, the growth of the principal commercial towns of Minnesota has been more rapid than in any western state of which we have any record. This necessarily follows from the extraordinary increase of the whole population, which we have shown to be in a ratio from five to eight times greater than in the fastest

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of the western states. The following table will illustrate the growth of some of the principal cities:

	Population.	Property.
Saint Paul, 1849,	400	$85,000
10 years, 1859,	14,000	5,771,201
Saint Anthony, 1849,	200	
10 years, 1859,	5,000	1,107,741
Hastings, 1854,	25	
5 years, 1859,	2,000	342,735
Winona, 1853,	60	
6 years, 1859,	2,750	1,175,603

Other cities and towns would show a similar growth to that above indicated, but I have been able to obtain the statistics of only a few. With the census in hand I shall be able, next year, to give a complete exhibit of the civic growth of the state.

City Finances.—In the Appendix will be found a progressive exhibit of the finances of the cities of Minnesota. The following is a summary of the items of property and taxation for 1859:

	Value of property.	City tax.	Expenditures.	Receipts.
St. Paul,	$5,771,201	15 mills,	72,555.72	$96,812.23
St. Anthony,	1,107,741	10 "	5,816.22	6,668.10
Stillwater,	788,110	7 "	3,584.32	5,834.56
Winona,	1,175,603	3 " in 1858,	2,240.22	1,054.68
Hastings,	342,735	10 "	3,700.00	2,492
Rochester,	196,823.50	5½ "	334.89	
Red Wing,	350,000	6 "	2,500	2,500

For the bonded debt of different cities, see Descriptive List of Bonds, Table VI.

For a detailed exhibit of the financial condition of different cities, see Table XII.

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CHAPTER X.

SOCIAL STATISTICS. PART I.

Education.

The public provisions for education in Minnesota relate to three distinct grades of educational institutions:

1. Common Schools; 2. Normal Schools; 3. A State University. Besides these, there are a considerable number of schools founded by private or denominational enterprise, some of which are chartered by the state and moderately endowed, and a State Agricultural College, the last having simply a legal existence.

1. Common Schools.

The common school system of Minnesota rests upon the basis of the following provisions for its maintenance:

(1.) A grant by Congress of sections 16 and 36 of every township of the public lands of the State; all deficiencies from fractions or prior occupancy to be made up from the public lands;—(act of March 3d, 1853,) being one-eighteenth of the whole area of the state, or about 2,888,000 acres.

(2.) A county school fund raised by a general tax of 2 1-2 mills on the total valuation of property in each county, and distributed from the county treasury to the several school districts, in sums proportionate respectively to the number of persons they contain between the ages of 4 and 21.

(3.) Twenty-five per cent. of all moneys paid for licenses for the sale of spirituous liquors and the proceeds of fines for several classes of statutable offences, which go to the county school fund.

The School Lands.—The school lands are wisely regarded by the state as a provision in reserve for the permanent interests of education. The constitution provides that the proceeds of these lands shall remain a perpetual school-fund to the state; that not more than one-third of such lands shall be sold in two years from the date of that instrument, one-third in five years, and one-third in ten years; that the most valuable shall be sold first, and that the principal arising from such sales shall forever be preserved inviolate and undiminished, the income arising from the lease or sale of the school lands to be distributed to the different townships in the proportion of the number of scholars therein, between the ages of 5 and 21.

Value of the School Lands.—The whole amount of school lands is estimated at 2,888,000 acres. This amount, in the proportion in which we have estimated the distribution of the different classes of areas, will be divided as follows, in reference to agricultural value:

Arable lands, ...	2,311,000
Uncultivable lands, but embracing valuable pine forests and minerals, ...	577,000
Total, . .	2,888,000

Of the arable school lands, about 250,000 acres are compact forest, and the remainder oak openings and prairie, including, say 220,000 acres of swamp land.

The whole amount of lands surveyed in Minnesota is 26,566,150 acres, more than one-half the whole area of the state; so that more than one-half the whole amount of school lands to which the state will be entitled, or 1,475,977 acres, are already surveyed, and subject, or nearly so, to the requisition of the state.

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Of the surveyed lands, 6,000,000 acres in round numbers, representing 333,000 acres of school lands, have been sold at $1.25 per acre, and the nominal price of $1.25 affixes to all the remainder.

Of the lands which have been sold, about 3,000,000 acres, representing 166,000 acres of contiguous school lands, are occupied by farms. When Iowa occupied nearly the same area of farm lands with nearly the same population, the average value of farms was $6 per acre. Subtracting 33 per cent. for improvements, $4 per acre may be assumed as a liberal valuation for 166,000 acres of school lands in Minnesota surrounded by farms. Of the remaining 166,000 acres included within the range of lands held by private owners, it is safe to assume an average of $2.00 per acre, so that for all the school lands within the districts held by private owners, 333,000 acres, the average price would be about $3 per acre, or $1,000,000 for the whole mass.

If this quantity were sold at the rate specified, interest thereon at 7 per cent. would yield but $70,000, considerably less than the sum now raised by taxation. All school lands within the present surveyed district, a little more than one half the whole, disposed of at successive sales in masses of 333,000 acres, as they successively reached the price of $3 per acre, would give the state a principal of but $1,427,691, yielding at 7 per cent. interest, an average income of but $309,938.37.

In another chapter, we have calculated the value of the arable lands of Minnesota in 1880 to be $12 per acre at the lowest estimate, and that one-half its whole area will command over $18 per acre. In 1880, then, one-half of all the school lands or 1,444,000 acres, will be worth an average of $18 per acre, yielding a principal of $25,992,000, and an annual income at 7 per cent., of $1,817,440, a magnificent fund, being much more than equal to the whole sum now raised in Massachusetts with her 1,200,000 inhabitants, for the maintenance of her splendid common school system. This calculation is based on the legitimate assumption that Minnesota in 1880 will have a population of 1,340,000, at the lowest estimate. Equal to Massachusetts in population, she will then, if she husbands her present capital, be superior in the resources of her school system, with this further pre-eminent advantage, that while the immense school fund of Massachusetts is derived from taxes imposed upon her people, that of Minnesota is the free gift of the nation, costing her people nothing but the exercise of common prudence in its management.

Which of the two policies for the financial administration of the school lands is preferable, that which fosters the principal of the munificent school fund at the disposal of the state, in the form in which it shall yield a permanently sufficient revenue for all the demands of common school education, or that which sacrifices the future for an inadequate provision for present exigencies, let the wisdom of the legislature determine.

Statistics of Common Schools.—We compile from the reports of the Superintendent of common schools under the territorial organization, a concise history of the schools of Minnesota.

Indian Mission Schools.—As far as can be ascertained, the first mission school in Minnesota was taught at the trading post of Mr. Aikin, at Sandy Lake, in the year 1832, by Mr. F. Ayre. He was succeeded by Mr. E. F. Ely.

In 1833, the Rev. W. T. Boutwell opened a school at Leech Lake, and in 1834 taught at Lake Pokegoma. The first school west of the Mississippi was taught by Miss S. Podge, late Mrs. G. H. Pond, in 1835, at Lac qui Parle. The next year, 1836, Rev. S. W. Pond taught at the Dakota village at Lake Harriet, west of St. Anthony. In 1837 a school was opened at Kaposia, and in 1840 was moved to Red Rock. In 1842 a school was commenced at the mouth of the St. Croix.

Schools in the White Settlements.—In the summer of 1847, at the request of Dr. Williamson, Miss Harriet Bishop was sent out to the then obscure village of Saint Paul, by the National Board of Education, to establish a school here, which was opened in July, the first regular English school in Minnesota, the army school at Fort Snelling excepted.

During the summer of 1848, another lady, Miss Amanda Hosford, now Mrs.

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H. L. Moss, under the auspices of the same Board, opened the first school at Stillwater.

In 1849, a Miss Baker, under the same patronage, opened the first school at St. Anthony. The Legislative Assembly of 1849 enacted a law for the support of common schools; but no school trustees were elected and no organization was effected till the next year. In 1851 the Rev. E. D. Neill was appointed superintendent of common schools in the territory, and a uniform series of books was instituted.

In 1852 the report of the superintendent gave the following statistics of the condition of schools in the territory:

	No. of School Houses.	No. of persons between ages of 4 and 21.	Average No. of Scholars.	Public Appropriations for 1851.
Washington Co.,				
Point Douglass,	1	not stated	15	not stated.
Stillwater,	1	"	42	"
Ramsey Co.,		1,016		
St. Paul,	2	205		$1,055.85
St. Anthony,	1		75	$613.47

And 8 districts without schools.

The table shows the following results for the state:

Number of school districts,	13
" " school houses,	5
" " scholars, partly estimated,	250

Since 1851 no statistics of the public schools, official or unofficial, have ever been published. It has not been known whether the school law was generally in operation or not, scarcely whether there were any public schools or not, and nothing at all has been known of their condition. There has in fact been no organization of the public schools, and no efficient superintendency, either local or general, except by private enterprise. This state of things has, to some extent, been remedied by the new school law, passed by the last legislature, providing for a thorough reorganization of public instruction, under the supervision of the chancellor of the university, as *ex officio* superintendent of Public Instruction. In the meantime the first attempt, for nine years, to throw any light upon the condition of the public schools, was made by the commissioner of statistics. Returns have been received from thirty counties only, the delinquent counties being Carver, Mower, Nicollet, Stearns, Crow Wing, Manomin and St. Louis. If these counties have any schools at all, some of their public officers might evidently be benefited by their instructions. The footings of the returns received from the reporting counties are given in the Table. In five of the reporting counties the number of schools is reported unknown, and in fifteen, or more than half the whole number of reporting counties, the number of scholars is reported unknown, a sufficient illustration of the lax and inefficient organization of our school system, under the old law, in the absence of a central administration. This want has been supplied by the action of the last legislature, in the appointment of an efficient state superintendent, although his usefulness is curtailed from the absence of any compensation for the onerous duties of the office. Estimating the number of scholars and schools for the counties which report their numbers unknown, upon the basis of the other counties, we have the following aggregate, exhibiting the condition of the public schools in thirty counties:

Condition of the Public Schools.

	In 30 counties.	Estimated for the state at large.
No. of school districts,	938	1,016
" schools, partly estimated,	860	880
" scholars,	19,200	20,800
" schoolable persons,	39,033	42,258
Amount of school tax,	$82,511.97	$88,911.23

The thirty counties giving these results represent a property valuation of $32,947,000, or nearly ninety-three per cent. of the whole property valuation,

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and consequently of the school tax of the state. The organized counties from which no reports were received represent about seven per cent. of the whole school fund. These facts form the basis of the estimates in the second column for the state at large. This certainly shows an unexpectedly favorable result, when the utter want of an organized administration of the schools is taken into account. It is possible that the number of schools and scholars may be stated too high, but, taking the figures as we find them, we deduce the following conclusions:

1. That there is one school to every forty-eight schoolable persons in the state.

2. That there are about 21,450 persons between the ages of four and twenty-one, or about one-half the whole number of schoolable persons, who do not attend the public schools.

A large proportion of the persons over fifteen years of age, in a state like ours, where the American population has come mainly from the free school states within a period of four or five years, would have received the rudiments of education in the states from whence they came, and the majority of these will not be likely to attend school. According to the United States census the proportion of persons between fifteen and twenty, in the whole Union, in 1850, was forty-one per cent. of the number of persons between five and twenty, or, perhaps, about thirty-five per cent. of the number between four and twenty-one years of age. This proportion would not be maintained in new settlements, which are mainly composed of young families. It will be safe, perhaps, to say that twenty-five per cent. of the whole number of schoolable persons in the state, or 10,000 in round numbers, are over fifteen years of age, and that 8,000 of these do not attend the public schools. There remain 13,000 children under fifteen years of age, who do not attend the public schools. A considerable proportion of these will be the children of foreign parents, many of whom are Catholics, who receive their education in parochial schools, under the supervision of the clergy. Besides these a numerous class of children in the cities and villages are distributed in private and parochial schools, academies, &c., not included under the head of public schools.

2. State Normal Schools.

An act of the legislature passed August 2d, 1858, provided for the establishment of three state normal schools, one within five years, a second within ten years, and a third within fifteen years from the date of the act. For the first of these as for the others the act appropriated $5,000 whenever a donation of the like sum should have been made for the purpose. In accordance with these provisions the citizens of Winona donated the sum required in money and lands as follows:

In lands, valued at	$3,650
In cash,	$1,500
Total,	$5,200

The lands were donated to the state of Minnesota. Accordingly the sum of $5,000 was drawn from the state treasury, and the site of the first Normal School located in the city of Winona. The normal Board have authorized the prudential committee to contract for material, looking towards an early completion of a building for the purpose. Steps were also taken to procure a Principal. Of the progress of the enterprise, since the first of January, no information has been received. See Official Directory, for members of the State Normal Board.

3. University of Minnesota.

The University of Minnesota rests upon the foundation of a grant by Congress, (see Congressional grants to Minnesota, chapter IX,) of seventy-two sections, or 46,080 acres of the public lands. This chapter was left open for information solicited from the Chancellor as to the condition of this institution, but which had not been received at the time of going to press. This concise general statement must therefore suffice. The Territorial legislature of Minnesota, in 1851, passed "An Act to incorporate the University of Minnesota, at the Falls of St. Anthony," providing that the proceeds of the Congressional land

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grant shall remain a perpetual fund for its support, and vesting the administration of the fund and trusteeship of the institution in a board of twelve Regents, elected by the legislature. The site selected for the institution is a very charming one, overlooking the picturesque scenery of the Falls of St. Anthony, and embraces a block of land adorned by a native grove of oak, and capable of effective embellishment. One of the first steps of the Board of Regents was the establishment of a preparatory department, in a frame building, opened November 25, 1851, by Prof. E. W. Merril. In 1856 this preparatory institution was replaced by a large and handsome edifice of stone, designed to form one wing of the future University. To build this structure, which has cost something over $45,000, the Board of Regents were allowed to issue their bonds, secured by mortgage upon the lands in question, and bearing interest at the rate of twelve per cent. per annum. In consequence of this measure, which threw the whole resources of the University into the torrent of financial disaster, which has engulfed so many private and corporate interests, the pecuniary prospects of the institution are under a cloud. Unless the State shall step in and release the lands of the University from the cumulative liens in which they are now entangled, or effect a compromise with its creditors, this splendid endowment may be entirely lost to the cause of education. For Regents, &c., see Official Directory.

4. State Agricultural College.

By an act of the legislature of March, 1858, it was provided that so much of a section of land in the town of Glencoe, McLeod Co., (described as section 16, township 115, range 28,) as the State might purchase, and all lands adjacent, not less than 320 acres, which might be donated, should be set apart for an experimental farm and as a site for an agricultural college, to be under the control of the President and executive committee of the State Agricultural Society. The citizens of Glencoe donated 320 acres of land for the purpose, but no steps have been taken by the state to fulfill the part assumed by her. The State Agricultural Society has, however, been reorganized in such a manner that its executive committee represents the county agricultural societies. As the institution is still inchoate no further remarks are necessary here.

Chartered and other Institutions of Learning.

The following chartered institutions of learning are maintained in connection with religious denominations.

Methodist.—Hamline University, located at Red Wing. No other particulars could be obtained from the officers of this institution, than the statement that the number of pupils averages, per term, one hundred. It has the following professorships: mathematics, law, and biblical literature, and a teacher of music and German. The name of the institution probably designates more accurately the laudable ambition of its founders, than its actual present *status*, which appears to be that of a flourishing academy.

Baptist.—Minnesota Central University, located at Hastings, March 28th, 1857. Incorporated March 4th, 1854. This institution is under the supervision of the Minnesota Baptist Association. It was founded upon a subscription by the citizens of Hastings, of $15,000, mainly it is presumed in lots. A building for the primary department, commenced in 1857, and, as now completed, is a substantial building, measuring forty-six by seventy-five feet, and three stories high. A school is in operation under Prof. W. F. Nelson. The institution is laboring under some financial embarrassment, but a plan of relief is in operation.

Presbyterian.—Baldwin Female Seminary, Saint Paul, school building in Walnut street. This institution owes its existence to the benevolence of a Christian philanthropist of Philadelphia, and is the oldest literary establishment in operation in the state, having been chartered in the winter of 1852–3, and opened in June, 1853. Its temporary suspension was occasioned by the sale of the school edifice, rendered necessary by the erection of a city hall and police station on the adjacent lot. A junior, intermediate and senior division repre-

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sent the grades of studies pursued. The rates of tuition being $6 for the first, $8 for the second, and $10 for the third, for a term of eleven weeks.

University of Southern Minnesota.—A preparatory school has been opened under this name, at Mankato, under the patronage of the Presbyterians. It is as yet in its infancy. No statistics received.

Catholic.—Under the head of institutions connected with religious bodies, though not incorporated, are the following Catholic schools.

1. St. Joseph's Female Academy, St. Paul, taught by sisters of charity.
2. St. Mary's Female Academy, St. Anthony, taught by sisters of charity.
3. Convent and Female Academy, of the Benedictine nuns, St. Cloud.

Besides these, more or less is done for the education of the poor, wherever the clergy of this church are regularly established.

Miscellaneous.—Of institutions not in connection with religious bodies, the following are all which have been reported to this office.

Saint Paul Female Seminary, a boarding school. Rev. J. G. Riheldaffer, proprietor. This school has a primary department, and junior, middle and senior classes. Tuition from $8 to $10 per quarter. Board, with furnished rooms, $38 per quarter. In addition to the elementary and higher branches of English education, instruction is given in music, drawing, crayoning, oil painting, and the modern languages. The sessions are of eleven weeks duration.

2. *The Chisago Seminary, Taylor's Falls.*—The course of studies at this school are represented to be a thorough preparation for a collegiate course. It is not a boarding school.

3. *Graded Union School, Wabasha.*—There are four grades of studies at this school, classified as grades A, B, C and D, the first including the more advanced, and thence descending to the elementary branches of English education. Two teachers are employed.

The Chatfield Academy.—This academy was incorporated by act of February 25th, 1855. The school was opened on September 1st, 1858, since which time it has been in constant and successful operation. The building was erected in the year 1857, at a cost of $2,000. The present number of teachers is four. The average number of pupils during the year has been seventy-two. The range of studies actually pursued, embraces the elementary and ordinary branches of English and classical education. The cost of tuition for the common English studies, is $5; or the natural sciences, history or mathematics, fifty cents extra for each; ancient languages, $1; modern languages, and book-keeping, $2; vocal music, $2; piano forte and melodeon, $10. These rates are given as affording the statistical elements for estimating the usual cost of tuition in the different branches of education. Connected with the academy, is a normal school department. "The Trustees and Teachers," says our correspondent, "regard this as an important feature of the institution. From fifteen to twenty of those now in attendance are designing to engage in teaching. Minnesota will not suffer by the comparison of its facilities for education in any grade of scholastic acquirement, short of that afforded by the higher colleges and universities, with the oldest and most affluent communities.

SOCIAL STATISTICS.—PART II.

1. CRIMES AND CONVICTIONS.

Reports upon this head have been received from only twenty counties, containing about three-fifths of the whole vote and, inferentially, of the population of the state. The aggregates for the twenty counties are as follows.

Number of indictments,		72
For crimes against persons,	16	
" " property,	17	
" " statute,	21	
Number of convictions,		54
Criminal cases not yet decided,	36	

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Applying the rule of proportion to the whole state, we have the following results:

Number of indictments,	122
" of convictions,	24
" of cases undecided,	60

The number of indictments in proportion to population, is about as 1 to 1439. The number of convictions, supposing one-third of the undecided cases to be convicted, which is about the usual ratio of convictions to indictments, will be about 44, a little more than one-third of the whole number of indictments. And the ratio of convictions to population, is as 1 to 3,854.

The following Table exhibits the Ratios of Crime in several States, compared with Minnesota.

	No. of Indictments.	No. of Convictions.	Ratio of Convictions.
Ohio,	3,571	1,284	1 in 1,950
Massachusetts,	4,248	1,295	1 in 841
New York,	———	1,842	1 in 1,900
Minnesota,	122	44	1 in 3,854

The comparison is remarkably favorable to Minnesota, but might have been expected in a population chiefly agricultural, with few towns above the standing of villages. A part of the result, however, is doubtless due to negligent police supervision. More crimes escape indictment in a community sparsely settled—but for the same reason, less are committed—and the record proves what might have been inferred from the character and antecedents of the population, that the rural emigrants from New England and the Middle States have brought with them the thrifty virtues of the country, without the vices of the seaboard cities. Something has been said in the local journals about the lax administration of justice in Minnesota, and in one or two notorious instances, the frontier settlers undertook to apply an extra-judicial remedy. The defect, however, is not in the courts, as statistics prove. In Ohio, there is no complaint of that kind, and there, of the number of persons indicted in 1857, *less than one-fifth were convicted.* In Minnesota, in 1859, more than one-third of the indicted persons were convicted. The difficulty, heretofore, has been, (1,) in the insecurity of our public gaols; and the statistics of escapes from prison would form a curious commentary on the condition of the gaols and the negligence of their keepers; and (2,) in the facility with which criminals in new and sparse settlements mainly composed of strangers to each other, elude detection.

2. Religion.

In this important department of social statistics I have been able to collect a mass of valuable details directly from the church records of the different denominations, or through the courteous assistance of their pastors. The statistical items vary so much, however, in different denominations, that a uniform classification of results is impossible. The enumerations of clergymen and of members or communicants are the most complete of any of the classes of items which appear in our record, and these show the following results for the different sects:

	Clergymen.	Members.		Clergymen.	Members.
Free Presbyterian,	20	669	Lutheran,	18	
Old School Presbyterian,	14	361	Episcopalian,	13	588
Methodist,	107*	4,542	Congregationalist,	47	1,446
Baptist, about	50	1,947			
Totals,				269	9,553

The Lutherans, at the average of other churches, would probably count 500 members, and the Universalists a few score more, giving in all about 10,000 members of Protestant churches. The Catholic Almanac claims a Catholic population in the state of 50,000 souls, or something less than one-third of the whole population of the State. See Religious Statistical Directory.

* These are traveling preachers. There are besides 108 local preachers.

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CHAPTER XI.

THE PUBLIC LANDS IN MINNESOTA.

The Public Lands in Minnesota.

Municipal Distribution of the Public Lands.—The area of the state, as carefully estimated for this volume, is 81,259 square miles, or 52,005,760 acres. As, however, the northern boundary of the state has not been surveyed, this can only be regarded as a close approximation. Of this mass there yet remain within the state of Minnesota, of Indian lands, not ceded to the United States, about 12,000 square miles, or 7,680,000 acres; and there are reserved or granted for various public purposes the following areas:

Congressional Grants to the State of Minnesota.—No state has ever entered into the Union more munificently endowed by the bounty of Congress. By the terms of the act of Congress of Feb. 26th, 1857, authorizing the people of Minnesota to form a State Constitution, (see Document A, of Appendix,) and by subsequent acts, hereinafter mentioned, the following grants of public lands and other property were made to the State:

1. Sections 16 and 36 in every township of public lands in said state, all deficiencies by fractional surveys or prior occupancy to be made up.
2. Seventy-two sections of land for the support of a State University.
3. Ten sections of land for the completion or erection of public buildings at the seat of government.
4. Twelve salt springs with six sections of land adjacent to each.
5. Five per centum of the proceeds of sales of all public lands lying within the state, which shall be sold by Congress after the admission of said state into the Union.
6. A grant of land to railroads, 4,399,141 acres in all. See chapter VII.
7. By an act of Congress, recently passed, all the swamp lands within the state of Minnesota are conferred upon the state.

Of the lands above granted, the school lands enure as the surveys are completed. See chapter X. The University lands were selected as follows:

State University Lands.

Total amount of grant is . .	72	square miles,	46,080 acres.
Amount entered previous to 1860, as per table below, ...	57 9-10	"	37,105 3-10 "
Amount entered in 1860, not yet reported,	14 1-10	"	8,974 7-10 "

Lands entered previous to 1860.

	Square miles.	Acres.
In Pine county, . . .	3	1,920
In Kanabec " . . .	15 2-10	9,753 47-100
In Mille Lacs " . .	10 18-100	6,520
In Sherburne " . . .	3	1,920
In Dakota " . . .	3 2-10	2,601 04-100
In Goodhue " . . .	1 9-10	1,241 66-100
In Rice " . .	21 38-100	13,689 13-100
Total, ...	57 9-10	37,105 30-100

The salt springs were selected in 1858 from a number which exist northwest of Otter Tail lake, in the Leaf Mountain district, and on the south branch of Wild Rice river. The swamp lands have not yet been set apart. For Railroad Land Grant, See chapter VII.

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Summary of Land Grants.

For schools, one eighteenth of the area of the State, or about	2,888,000 acres.
For a State University,	46,080 "
For completing the public buildings,	6,400 "
Land adjoining 12 salt springs, for the use of the State,	46,080 "
For railroads,	4,399,141 "
Swamp lands, estimated,	5,000,000 "
Total,	12,385,701 "

*Indian Lands and Reservations.**

	Acres.
Winnebago Reserve, Blue Earth Co.,	207,360
Reserve on Mille Lacs, (Chippewa,)	69,120
Gull Lake Reservation, "	92,850
Rabbit Lake " "	42,050
Grand Portage Reservation, on Pigeon River, Lake Superior, (Chippewa,)	41,046
St. Louis River " "	125,294
Minnesota River " on south side of river, (Sioux,)	710,400
Red Pipe Stone " "	640
Total acres of reserved lands,	1,288,760
Indian lands unceded,	7,680,000
Total number of acres of Indian lands,	8,968,760

Unsurveyed Reservations.—The above are all the *surveyed* reservations. There are, besides, the following unsurveyed reservations, of which we have no estimate of contents:

1. The Sioux Reserve, 10 miles wide, on the *north* side of the Minnesota river, as described in treaty of 1851.

And the following Chippewa reserves, described in the treaty of Feb. 22, 1855: 2. *Pokegoma Lake.* 3. Sandy Lake. 4. Rice Lake; all the islands in the lake and half a section of land on it. 5. Leech Lake, on the east side of lake. 6. Winnibegoshish Lake, on its north side. 7. Cass Lake, on its north side.

Military Reservations.

Fort Ripley, east of Mississippi river, estimated from survey diagram,	64,000 acres.
Fort Ridgley, on Minnesota river, estimated as above,	62,500 "
Fort Abercrombie, on Red river; whole Reservation, estimated, 30,720 acres, of which there lie in Minnesota about	11,520 "
Total,	138,020

The following statement will show the amounts absorbed in grants, reservations, or primary occupancy:

Unceded Indian lands,	7,680,000 acres.
Indian Reservations, surveyed,	1,288,760 "
Military Reservations,	138,020 "
Land Grants to the State of Minnesota,	12,068,900 "

The Public Surveys—Their Extent and Progress.

Of the public lands in Minnesota, according to memoranda politely furnished by the surveyor-general, there had been surveyed or laid off into townships, up to May 17th, 1860, 41,509 square miles, or 26,565,760 acres, a very little more than one-half the whole area of the state, of which there remained to be subdivided into sections 8,964 square miles, or 5,736,960 acres.

The first sub-divisional surveys made in Minnesota were in 1847, consequently

* From memoranda furnished by surveyor-general.

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the surveys have progressed at the rate of 2,043,520 acres annually. In 1857 Minnesota, which had been included in the Iowa and Michigan land-districts, was erected into a separate district, with the office of surveyor-general at St. Paul. The aggregate amount of surveys made under the surveyor-general of Minnesota for the three years since the establishment of his office in 1857, is as follows:

Township lines, 5,673 miles. This includes of guide meridians and standard parallels, 1,170 miles; area covered by these surveys, 17,100 square miles, equivalent to 10,946,100 acres.

Cost of the Surveys.—The amount expended for the sub-divisional surveys was $94,980.40, or at the rate of about one and one-half cents per acre. The whole amount appropriated for the public surveys in Minnesota in the three years—1857, 1858, and 1859—exclusive of the salaries and office expenses of the surveyor-general, was $146,000. The whole cost of the actual survey of 10,946,100 acres, including 6,108,681 acres of sectional sub-divisions, has been one and one-third cents per acre. The regular annual appropriation for salaries and clerk-hire in the office of the surveyor-general is $8,300, or $24,900 for the three years. There are, perhaps, other expenditures, but these items include the mass of expenditure for the surveys in Minnesota, showing a total of $173,900, equivalent to a little over one and one-half cents per acre, or 1.58 cents. At this rate the whole cost of the surveys in Minnesota up to the middle of May, 1860, was about $420,000.

Surveys of 1859.—The amount appropriated for surveys in 1859 was $21,000, which was expended in running the following lines:

Township lines, including guide meridians and standard parallels, 685 miles; sub-divisional lines, including six hundred and seventy miles of meandered lakes and streams, 3,463 miles, the area of land embraced in above sub-divisional surveys being 1,071,768 acres, costing $16,219.98, or at the rate of one and one-half cents per acre.

During the past year the western boundary of the state from Lake Traverse to the Iowa line was surveyed and established under a special appropriation by Congress for that purpose, and the work has been inspected by the surveyor-general. The districts surveyed in 1859 were chiefly in the western portion of the state, including the upper portion of the Red River valley, the Otter Tail district, and thence southward to the Iowa line, and in the north-eastern land-district on the north shore of Lake Superior.

Progressive Statistics of Land-office Transactions

For the purpose of disposing of the public lands, the state is divided into eight land districts. The statistics of the annual transactions of the several land offices in the state since their establishment, are given in detail in Appendix. The results for the several land-offices and also for the several years, are tabulated in the following statements:

1. *A Recapitulation of the Results of the Statistical Exhibit of Land-office Transactions in Appendix.*

Land Office.	Whole number acres sold.	Acres covered with land warrants	Acres covered with half-breed scrip.	Amount received in cash.
Cambridge,	1,136,970.82	701,561.19	9,274.10	$532,299.29
St. Cloud,	389,453.90	285,080.00	680.00	130,683.55
Forest City,	542,855.43	286,784.14	31,768.59	292,784.09
Henderson,	1,001,513.57	642,894.08	75,926.99	366,364.33
St. Peter,	1,562,371.66	1,138,120	53,770	468,235.42
Chatfield,	1,471,984.10	1,046,184.23		563,520.27
Portland,	21,955.82	15,690.24	4,320	2,481.97
Otter Tail City,	9,006.00	273.00	8,680	66.25
Total,	6,136,111.30	4,116,586.89	184,419.68	$2,356,435.17

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2. *Progressive Summary of the same by Years.*

Year.	Number acres sold.	Cash receipts.	Year.	Number acres sold.	Cash receipts.
1848,	15,381.38	$9,943.51	1854,	314,714.76	$368,099.35
1849,	16,785.91	2,554.72	1855,	1,132,672.49	1,122,843.17
1850,	36,709.10	4,698.76	1856,	2,334,298.18	598,427.24
1851,	34,915.53	17,553.61	1857,	1,468,434.40	143,681.39½
1852,	32,893.28	5,051.80	1858,	482,856.44	26,937.72½
1853,	76,074.26	47,327.47	1859,	190,342.57	9,309.47
Total, ...				$6,136,111.30	$2,356,435.17

The following general results appear:

The total amount of government land sold in Minnesota from the 14th of August, 1848, to December 31st, 1859, was 6,136,111.30 acres, of which there were entered with bounty land-warrants, 4,116,586.89 acres; with Sioux Half-breed scrip, 184,419.68 acres, and with cash, 1,885,148.13 acres.

The total amount of money paid into the treasury of the United States on account of lands sold for cash in the same time, was $2,356,435.17. Estimating the total amount of lands sold at $1.25 per acre, and a contribution of $7,670,139.12 to the national treasury should be placed to the credit of Minnesota.

The whole amount of Half-breed scrip issued in lieu of the Sioux Half-breed Reservation on Lake Pepin, represented 316,800 acres of land, of which an amount covering 184,419.68 acres has been located in Minnesota, leaving 132,380.22 acres still in reserve, or perhaps located in other states.

Attention is particularly directed to the sudden and enormous increase in the entries of public lands in the years 1854, 1855, and 1856, expanding from 76.074 acres in 1853 with the torrent of population and speculation to 314,714 acres in 1854, and to 2,334,291.18 acres in 1856, and suddenly contracting again with the revulsion of 1857, till in 1859 the sales were only 190,000 acres in all, or less *than one-twelfth of those of* 1856. The entire course of speculative activity and monetary exhaustion, the antecedent and consequent phenomena of the crisis of 1857 as it operated in Minnesota, the prodigious inflation, the abrupt collapse, are minutely registered in the sensitive scale of land speculation represented by the above table.

The whole amount of lands entered from 1848 to 1853 inclusive, was 212,759 acres, and the cash paid was $87,129, of which more than half was paid in 1853. From 1854 to 1857 inclusive, the amount of lands entered was 5,250,153 acres, *or nearly twenty-five times as much as in the former period*, and the cash paid was $2,333,051, or over *twenty-six times the receipts of the former period.* Estimating the average price of land-warrants at $1, the whole amount of cash paid in the former period up to and including 1853 for public lands, was $230,185.37; in the latter period from 1854 to 1857 inclusive, $5,696,720; and the whole amount of cash paid by patentees of the public lands since 1848 to December 31st, 1859 inclusive, is $6,608,498, of which $681,593 only have been paid since 1857. Let us state these results in tabular form:

	Whole number acres entered.	Cash paid to land offices.	Whole amount of cash invested.
From 1848 to 1853 inclusive,	212,759	$87,129.87	$230,185
" 1854 to 1857 "	5,250,153	2,233,051.15	5,696,720
" 1858 to 1859 "	673,199	36,247.19	681,593
	6,136,111	$2,356,429.81	$6,608,498

It is a fact worthy of special notice that almost all the lands entered on the west side of the Mississippi river, or four-fifths of the whole amount of entered lands, have been purchased by pre-emptors, that is to say, by persons who have ostensibly appropriated the lands for their own use. The fact is said by a local journal to have been elucidated by Senator Rice at Washington, a few years ago, that the number of acres of land thus entered by actual settlers in the years 1855, 1856 and 1857, exceeded in amount the aggregate pre-emptions made in all the states and territories of the Union during the same period. Yet as a large amount of these pre-empted lands have passed in one way or another into the hands of third parties, the owners or lenders of the purchase money, the

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number of pre-emptions, even if we could give them, would afford no index to the actual and permanent settlements made. We may be pardoned for anticipating the results of the census by the following estimate of the number of acres actually occupied:

According to a previous estimate, there were in 1859, 21,600 farms in Minnesota. By taking the average size of a Wisconsin farm in 1850, or 148 acres as the average in Minnesota, we have 3,196,800 acres occupied by farms, to which may be added 100,574 acres of town lots, making 3,296,374 acres in all, of occupied lands, exclusive, of course, of Indian and Military Reservations.

The following figures will show the proportion of lands appropriated, occupied and tilled, relatively to the whole mass of surveyed lands, and the whole area of the state:

Area of state,	52,005,760 acres.
Area surveyed,	26,565,760 "
Area appropriated,	6,136,111 "
Area occupied,	3,296,374 "
Area tilled,	454,000 "

The Prospective Increase in the Value of Lands in Minnesota.

The commercial value of land depends, other things being equal, upon the nnmber of its occupants, which has a generally definite relation to the amount of land actually in use. In other words, population is the measure of demand, not an absolute or fixed measure, it is true, but sufficiently determinate, nevertheless, for general purposes. To ascertain the prospective increase in the value of lands in Minnesota, it is therefore necessary to begin with the prospective increase in population.

It has been shown in a preceding page that Minnesota has increased in population in the last ten years, 3,322 per cent., or five times as fast as the most rapidly growing states in the Union, in the most rapid period of their growth, and 120 times as fast as the average of the whole Union. This, of course, affords no rule for estimating the future growth of the state, except as an indication of its relative position among the North-western states in the scale of progress.

It is important to observe, in estimating the growth of population, that as the absolute population increases, the actual or arithmetical increase is more, and the relative or geometrical increase less. In order to arrive at a reliable rule of estimate for the future growth of Minnesota, from the experience of other states, it is necessary to recur to the period in their growth when they had nearly the same population as Minnesota now has.

In 1830, Illinois had	157,445 inhabitants.
In 1820, Indiana had	147,178 "
In 1840, Michigan had	212,267 "
In 1850, Iowa had	192,214 "
In 1860, Minnesota has about	175,000 "

Now, the average decennial increase of the above states upon this nearly equal footing, will afford a fair basis for estimating the future growth of Minnesota, taking into account the special impetus given to the growth of new states by agencies developed in the last decade. These agencies are: 1. Improved facilities of communication. 2. The increase of foreign emigration.

The effect of these causes in promoting the settlement of the new states, will appear from this statement: Starting from the same point in population as Minnesota, it took Indiana 23 years, Illinois 20 years and Michigan 35 years, before the era of railroads, to attain the same population which Minnesota acquired in 10 years.

The average decennial ratio of increase of these states at corresponding periods, relatively to the decennium when their populations were nearly the same as the present population of Minnesota, will be shown by the following table:

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	2d Decade of Minnesota. 1830–40.	3d Decade. 1840–50.	4th Decade. 1850–60.	
Illinois,	202.44	78.81	83.	ratios per cent.
	1820–30.	1830–40.	1840–50.	1850–60.
Indiana,	133.07	99.94	44.11	31 per cent.
	1840–50.	1850–60.		"
Michigan,	87.34	41		
Averages,	141.28	73.25	68	31

Moving at the same pace with other Northwestern states, Minnesota should have had in 1860 about 20,000 inhabitants, or an increase of 400 per cent. in her first decade of growth. But she has, in fact, about 175,000, an increase of 3322 per cent., more than eight times the average ratios of other states. Iowa, moving at the same rate as the other states, in the second decade of her growth, should have had in 1860, 462,000 souls, or 141 per cent. increase; she has, in fact, 650,000, or 230 per cent. increase. Wisconsin, in the third decade of her growth, would have in 1860, by the same rule, but 526,000, or 73 per cent. increase. She has, in fact, over 700,000, or 130 per cent. increase. Minnesota is just passing into the second decade of her growth, with a population probably of 175,000. She will, therefore, moving upon the same plane of progression as Iowa and Wisconsin, in corresponding periods of growth, under the pressure of the same permanent causes, have a population in 1870 of 583,000, and in 1880, of 1,340,000.

But to the agencies already stated as accelerating the increase of population in the new states, must be added another element in the future growth of Minnesota, which must come into full and effective operation before the close of the decade just commenced, and that is, the restricted supply of fertile lands for the formation of new settlements in the west and south, and the inevitable determination of the whole westward movement of population in the direction of Minnesota and the Northwestern region beyond, which underlies its future. This question in its application to the country Northwest of Minnesota, has been discussed in Chapter I., and from the propositions there advanced, the following corollaries were deduced:

1. That, as the expansion of frontier settlement is restricted by physical causes, the increase of population and wealth in the existing states will be proportionately accelerated, and the demand for land in the present limits of settlement increase.

2. That the supply of land being positively limited, its value will be enhanced in the compound ratio of the diminishing supply and increasing demand.

Space will not permit the arithmetical application of these principles to the subject in hand. But obvious as these principles are, and demonstrable as are the conclusions to which they point, we do not now propose to include them in our estimate of the future growth of Minnesota, but to adhere to the law of growth already developed, as applicable to existing circumstances. Now, the conterminous states of Illinois and Indiana, with a very little larger area than Minnesota, had together in 1850, a population of 22.3 to the square mile, precisely the status we have assigned to Minnesota in 1880. They had together, 170,104 farms of 147 acres each, embracing an aggregate area of 25,830,834 acres, worth an average of $18.84 per acre. Upon this basis we may calculate with tolerable certainty that, in 20 years from now, the increase of population in Minnesota will have absorbed about 26,000,000 acres of its arable lands for farming purposes, being 67 per cent. of its whole agricultural area, and leaving but 12,000,000 acres unoccupied. Of this 12,000,000, at least 4,000,000 acres may be deducted for swamp lands and water surface, and leaving but 8,000,000 acres of immediately arable lands unoccupied. In twenty years from now, upon the same basis, more than two-thirds of all the arable lands of Minnesota will be worth an average of $18.46 per acre, equivalent to an average of $12.28 for the whole arable surface of the state.

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CHAPTER XII.

BENEFICIAL EFFECTS OF THE COMMERCIAL REVULSION OF 1857.

Arrest of Immigration.—The first effect of the commercial disasters of 1857, was to stop emigration to the West, and with this sudden check to the growth of population, arrest all the movements based upon it. The increase of population in Minnesota, before 1857, was 56 per cent. yearly. It was 60 per cent. yearly from 1851 to 1858, and 112 per cent. yearly from 1855 to 1857. All the schemes of the day, the values of property, the business enterprises, were founded on these ratios of growth in population. Lands were bought to supply the demands of an immigration which promised to absorb an empire in its augmenting train. Rates of interest were adjusted to a scale of expectation that was extravagant indeed, but which had its warrant in every one's experience. Towns were created by scores far in advance of settlement to collect the tolls of the anticipated procession of emigrants, with hotels to entertain them, with post offices and hotels and stores to meet the wants of expected communities. The sudden arrest of this influx of population, whose annual duplication opened a market, apparently without limit, at the door of every farmer and merchant, and mill-owner, which had given labor to the mechanic, and universal activity to all pursuits, was a severe test of the resources of the community, and, added to the withdrawal of bank circulation, and the prostration of private credits, inflicted wide-spread and acute distress.

Property Expansion.—The table under the head of "*Increase of Wealth,*" in Chapter IX., shows an average increase in the value of property in Minnesota, from 1849 to 1857, of 81.6 per cent. yearly. The three years preceding 1857, show the following average ratios of increase, and amounts of actual increase.

	Rates of Increase.	Actual Increase.
1855, . .	197 per cent.	
1856, . . .	134 "	1854, $3,508,878
1857, . .	102 "	1857, 49,336,673

The increase in three years being over 1,400 per cent. A prominent element in this augmentation of wealth was the extension of landed property, exhibited in the previous chapter. Thus, in 1853, the whole amount of private lands owned in the state, was 212,759 acres. From 1854 to 1857 inclusive, 5,250,153 acres of lands, in the richest part of the state, were added to the bulk of private property. Population at the same time increased from about 35,000 in 1854, to 150,000 in 1857, or about 328 per cent. increase. In other words, the property status of 1854 gave a valuation of $100 and six acres of land to each person, and in 1857, a valuation of $329 and 36 2-5 acres to each person in the state. This comparison tells the whole story of the inflation of values which accompanied the excessive speculations in real estate, in the period in question.

Depreciation of Property.—A decline in the value of lands was the necessary consequence, (1,) of the contraction of the monetary circulation of the country, and, therefore, of the measure of value, and, (2,) of the sudden arrest of immigration upon which the demand for lands was based. The general effect of the monetary revulsion upon property is exhibited in the following figures, showing the decline in valuation, for the years following 1857:

1857, . $49,336,673 . 1858, . $41,846,778 . 1859, . $35,564,492

The decrease for the two years being about 30 per cent. The corresponding

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check upon speculation is shown in the following statement of the entries of land at the land offices, for the years following the crisis:

1856,	2,334,298	1858,	482,856
1857,	1,468,434	1859,	190,342

Assuming an increase of 20 per cent. in population, if property had been maintained at the valuation of 1857, it would have been about $59,000,000 in 1859, to which must be added the value of the lands entered from 1857 to 1859 inclusive, 2,141,632 acres in all, worth at the minimum of $1.25 per acre, $2,677,040; giving a total valuation for 1859, on the basis of 1857, of $61,677,000. The actual valuation was $35,564,492, showing a falling off, therefore, from the standard of 1857, of about 40 per cent. And this is, in fact, an approximation to the average rate of depreciation throughout the state. Space will not permit the tabulation of answers received from different localities as to the depreciation of real estate, but the general statement will suffice that real estate is reported to have declined in its estimated value, from 33 to 50 per cent. below the prices of 1857, with no sale at those figures. The crucial test of cash would probably develop a lower scale of actual values. Now as the whole theory of western growth is based on the relative cheapness of its lands, every step in this decline of prices must be regarded as so much gained to the permanent prosperity of the state. In other words, we offer in the element of cheap lands, an inducement to settlement, 40 per cent. greater in 1859 than we did in 1857. That is one effect of the revulsion. Its practical importance is already felt in the returning tide of emigration.

Civic Overgrowth and Decline.—A prominent characteristic of the period of expansion above defined, in which all the northwest shared, was the extraordinary impulse which was given to civic growth at the expense of agricultural development. By what is here designated as civic overgrowth, is meant, not only the undue concentration of population in towns and villages, but the extraordinary multiplication of naked town sites, far in advance of population. Speculation in these "fancy town sites," as they are popularly called, was based on the same rationale as the adventures in wild lands. It was the appropriation of the most desirable points in advance of the population which was to sustain them. Each of these town sites had its own little theory of development deduced from the common experience of the day, and the ingenious fiction, plausibly portrayed in lithographic plots and diagrams, often enticed considerable investments. I endeavored by inquiries addressed to the Registers of Deeds, to ascertain the number and aggregate area of the town sites in this state. Answers received from only eighteen counties are given in table.

The following is a summary of the results, showing the number and area of town plats recorded from 1853 *to* 1859.

	No. of Town sites.	No. of Lots.	No. of Acres.
1853,	3	1,567	657
1854,	30	8,354	2,719
1855,	44	20,944	5,196
1856,	107	39,683	13,966
1857,	182	90,584	20,855
1858,	50	18,076	4,689
1859,	12	4,932	1,462
	428	184,240	49,544

Number of town sites,	428
Average number of acres per plat,	115
Average number of lots " "	437

The vote, and consequently the population of these counties is 47 per cent. of the whole. Applying the rule of proportion to the remaining counties, we have:

No. of town sites, 868; No. of lots, 374,000; Area in acres, 100,574.

The cultivated area of the state is estimated at 454,000. So that the area occupied by town lots is actually equal to 22 per cent. of the tilled area of the state. The number of lots actually occupied is about 12,000, estimating the

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population of towns and villages at 60,000, leaving about 362,000 lots *unoccupied and unimproved.* In other words, there are thirty times more town lots than are at all necessary, unless we allow a large reserve for urban ventilation. If each of these town lots were occupied by a dwelling, they would accommodate a population, at the usual average of occupants, of over 2,000,000 souls, implying an aggregate state population of 6,000,000, somewhat more town-room than our present exigencies require.

If the most extravagant expectations of the future growth of the State should be realized, it would require a period of sixty years to absorb the town lots already laid out. Of this excessive town-site development, nearly four-fifths was recorded in 1855, 1856 and 1857. In 1858 the entries were only about one-quarter of those of 1857, while in 1859 they were but one-fourteenth those of 1857. This abrupt arrest of speculation in town lots, and their restoration to agriculture, illustrates one of the first and best effects of the reaction of 1857. We have no statistics as yet of the commercial value, in 1857, of the large class of town lots described as "fancy." If they were held at an average of $10 each, certainly not a high figure, they would represent, at the standard of 1857, about $3,000,000 of imaginary fortunes, which disappeared entirely in the crucible of the crisis. If the aggregate were twice this it would not show a large proportion of the bulk of landed property; and when it is recollected that a very small part of these lots passed from the hands of the original proprietors, it will be seen that "fancy town lots," notwithstanding the noise made about them, were really a very trifling element in real estate market. The remaining town property, having an actual commercial value, shared only in the general depreciation of all landed property, the ratio of decline being less in the chief towns and greater in the smaller. The following table exhibits the depreciation of town property in some of the principal cities, since 1857:

	1857.	1859.	
St. Paul,	$5,791,585	$4,955,984	
St. Anthony,	2,446,800	1,107,741	
Winona,	1,455,920	1,175,603	—1858.
Hastings,	719,797	—1858. 342,735	

The amount given for St. Anthony includes personal property, and consequently the decline exhibited is much greater than in real estate alone. In Winona there was no assessment for 1859; in Hastings none in 1857. The actual depreciation is, perhaps, greater than this. The correspondence of this office shows a general depreciation of thirty to fifty per cent. in the principal towns of the State. This, then, is another beneficent effect of the revulsion. Heretofore a poor man, in any one of our principal towns, found it impossible to secure a home on any terms. This obstacle to comfortable subsistence is removed from the path of the poorest.

Necessarily consequent upon this arrest of commercial activity and the dissipation of fictitious wealth, was a diminution of the excessive civic population. The towns are reluctant to report the extent of this diminution, but the conclusion, based upon a comparison of votes, is sustained by reports from several towns, that the town population has decreased twenty per cent. since 1857. This population was principally transferred to agricultural pursuits. It was simply the adjustment of population upon the natural and reciprocal conditions of urban and rural growth. It was so much taken from the non-producing class and so much added to the productive industry of the country.

Expansion of Agriculture.—As a consequence of this return to agricultural pursuits, it is estimated by competent men in different counties, that the cultivated area of the State was more than doubled in 1858, in some counties being more than quadrupled, while 1860 will add a quarter more to the breadth of land in crop. This fact is indicated by the abrupt decline in the prices of agricultural products which followed the harvest of 1859. In 1857 *wheat* was worth $1.37 per bushel at St. Paul. In the spring of 1859 it was worth $1.12; in the fall, 50 or 60 cents.

Fall of Rents.—Consequent upon the exodus of town population and the decline in property, was the fall of rents. Reports from correspondents indicate a fall of fifty per cent. in rents of stores, dwellings and offices. This decline

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was assisted by competition with the new structures which were erected in great numbers, in consequence of the low wages and the cheapness of materials, during the general prostration of business. The average per centage of rent realized on the value of buildings in 1857 was twenty-five to fifty per cent. In 1859 it was from ten to fifteen per cent. The result is a practical increase in the scale of comfort of all classes, and, if not an actual increase in the profits of business, the decreased receipts are largely compensated by the diminished rents and cost of living.

Increase of Building, Wages, &c.— Closely connected with the question of rent is the cost of construction, the elements of which expose the condition of different branches of industry. The following table shows the comparative cheapness of building in 1857 or 1859:

	1857.	1859.
Cost of lumber per thousand feet,	$20 *a* $30	$12 *a* $22
" laths " "	3	1.50 *a* 1.75
" Shingles " "	6	2.25 *a* 4
Wages of day labor,	1 *a* 1.50	.60 *a* .80
" mechanics per day,	2 *a* 2.50	1.25 *a* 1.75

This state of things concurring with the release of capital from other pursuits, produced two results of the highest importance to the character of urban architecture. Before 1858, when money was worth two and three per cent. per month, the rents, high as they were, would not pay the current rates of interest on construction, except upon the poorest and cheapest buildings. The consequence was that our cities and towns were built up of flimsey, uncomfortable and unsafe structures. But in 1858 and 1859 the relation of rents to cost of construction was greater than the current rates of interest. Hence there was: 1. A remarkable increase in the number of buildings erected. 2. A great improvement in the character of buildings. If the relative number of new structures reported in the chapter of town statistics may be taken as a guide, a remarkable increase is shown. The following table shows the number of new buildings erected in 1859, in the reporting towns:

New Structures of 1859.

	Pop'lat'n.	No. of new structures.	Cost.		Pop'lat'n.	No. of new structures.	Cost.
Le Sueur,	220	11	$10,500	Hastings	2,000	27	
Sauk Rapids,		3	1,500	Monticello,	300	4	$1,800
Nicollet,	1,000	60	7,500	Belle Plaine,	500	20	17,300
No. built since 1857,		250	30,000	Henderson,	750	11	15,000
Anoka,	785	29	15,000	Spring Valley,	203	10	8,000
No. built since 1857,		175	70,000	Winona,	3,750	35	40,000
Owatonna,	480	19	13,000	Faribault,	1,500	21	35,000
Lake City,	1,000	35		Chatfield,	1,250	24	16,000
					13,745	309	180,600

The table shows a new building, averaging about $588 in cost, to every forty-four persons, in the towns represented. This proportion would be more than sustained throughout the state, and the proportion is probably as great as to number, though not as to cost, in purely rural districts. This would give, therefore, about 4,000 new buildings for the whole state, at an aggregate cost of about $2,000,000, deducting for the cheaper rural structures. The number of buildings erected in 1858 was much greater in the towns and less in the country. It is a safe estimate that $4,000,000 have been added to the permanent wealth of the country, in the form of new structures, since 1857.

Decline of Interest.—The decline of interest is the inevitable result of growth to the point of surplus production. The commercial reaction of 1857, did not produce, although it precipitated this decline. In an agricultural community the rates of interest paid for capital will be governed primarily by the profits of agriculture. These are always relatively greatest at the early stages of growth, when the annual increase of population supplies a local market for all the products of the soil, and they decrease as production advances beyond local consumption and comes in competition with other states in the central markets.

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All new states, therefore, pass through periods of high rates of interest, based on the great profits of industry, when the proportion of consumers is always relatively greater than the producers, followed, of course, by an epoch of financial distress, when, with the abrupt decline of his profits, the borrower must sustain the high rates of interest incurred in the season of larger returns. At this point it is usual for legislative bodies to interpose with laws restricting the rates of interest, already restricted by laws superior to legislation. The usual rate of interest from 1854 to 1857 was from two to three per cent. In 1859 twelve per cent. was the ordinary rate.

General Summary.—The permanent effects of the financial revolution of 1857 are these: 1. An increase in the active capital of the country. 2. A decrease in the cost of production. 3. A decrease in the cost of living. 4. An increase, therefore, in the relative profits of industry. 5. And an increase in the scale of individual comfort and actual wealth. But this review of the consequences of the monetary reaction of 1857 would leave an inadequate impression, if, in considering the beneficent effects of the shower, we should overlook the disasters of the storm. The evil consequences of this event may be summed up in one word—Debt—incurred in prosperous, to be discharged under adverse, circumstances. The subsisting indebtedness of the people of Minnesota, I infer to be of two classes relatively to the objects for which it was incurred: 1. For the purchase money of lands, either for speculative or productive purposes. 2. Mercantile debts. As the annihilation of credits by the collapse of 1857 made the incurring of new obligations impossible to any considerable extent, it is a legitimate conclusion that the present indebtedness consists, mainly, of undischarged liabilities, incurred before that period, and that by the ordinary methods of adjustment, it exists either in the form of judgments against the property of the debtor, or in mortgages secured upon his property. Its extent is, therefore, definitely ascertainable from the public records. To circulars of inquiry upon this subject, addressed to the Registers of Deeds and District Clerks, answers were received from only fifteen of the former and nineteen of the latter, and upon these it is difficult to base any accurate generalization. I feel authorized, however, to make the following remarks in contradiction to opinions extensively promulgated by those interested in exaggerating the extent of the private indebtedness of the people:

The aggregate of the private debts of the people of Minnesota is not greater in proportion to its resources, to the value of property, or to the number of its inhabitants, or generally to the means of payment, than in some of the most flourishing states of the Union. Whatever it may have been in 1857, in 1860 it has exhausted its effect, as a burden upon the general resources of the state in the process of adjustment or liquidation. The debts incurred for speculative purposes have generally been expiated by the transfer of the property of the debtor, and the greatest part of the debt expressed in judgments, applies to bankrupt estates of this class, and do not operate against the existing owners of property. Of the large class of debts contracted for the purchase and improvement of farms, a great proportion has been paid, or is in course of adjustment.

In support of these views, reports from fifteen counties give the following results, as to the amount of mortgage debt for several years.

	Mortgage Debt.		Mortgage Debt.
1854, ...	22,553	1857, . .	1,787,158.81
1855, ...	150,014	1858, . . .	2,124,071.10
1856, . . .	1,176,905.47	1859, . .	1,211,303.10

Now, as no new debts were contracted after 1857, the mortgage debt above given for 1858, is simply the *conversion into mortgages*, of all the debts previously existing in other forms, and so the amount given for 1859 is the renewal of matured mortgages. It is to be regretted that the amount of the above debt which *had been discharged*, was not returned. As mortgages to secure payment for real estate were given for an average period of one year with a year for redemption after foreclosure, it is fair to presume that nearly all the mortgages given before 1858 have been discharged, that those given in 1858 have been foreclosed, and that, finally, the mortgage debt remaining to be adjusted is for the year 1859, which is, generally speaking, the renewal of past obligations

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upon increased securities. In the fifteen reporting counties, the mortgage debt for 1859 is $1,211,203. These counties represent an aggregate property valuation of $12,118,000, or a little over one-third that of the whole state. Upon this basis, the mortgage debt for the whole state for 1859, would be about $3,500,000. In 1858, it was by the same rule, $6,000,000, *showing a decrease of the recorded indebtedness of the people of Minnesota, in one year, of* $2,500,000. The amount of judgments rendered in 1859, in nineteen counties, representing $14,698,236 valuation of property, was $978,608, which would give in the same ratio, the best rule which can be adopted, $2,446,000 of judgment debt for the whole state, of which a large proportion applies to bankrupt estates. The amount of private debt not expressed in these forms, is inconsiderable. The aggregate private indebtedness of the people of the state will, therefore, be as follows:

Mortgage debt,	$3,500,000
Judgment debt,	$2,446,000
Total,	$5,946,000

Showing that the liens upon the property of the people amount to only one-sixth of its whole appraised value. Liens of the same classes upon property in Ohio, are equal to one-ninth of the whole property valuation of the state. Now, when it is considered that nearly the whole material superstructure of social life in Minnesota was erected within the five years, from 1854 to 1859, inclusive; that within that period there were purchased by its citizens 5,925,000 acres of land from the general government alone, at a cash outlay of $6,380,000; that within the same time over 20,000 farms have been opened in her borders, containing about 440,000 acres of ploughed land; that, in the same time, over 30,000 buildings have been erected for domestic or business purposes, including 373 mills, and 191 steam engines; that all these, with school-houses, and churches, and roads, and bridges, have been erected wherever they were needed, from the capital of the poor emigrants who composed the bulk of its population—considering these facts, we say, the small proportion of subsisting debt which this immense outlay has entailed upon the people, and its rapid diminution in the face of successive seasons of disaster, must be regarded as a wonderful proof of the natural resources of the country. The whole private and corporate indebtedness of the people is about as follows:

State debts,	$330,000
Contingent railroad debt,	2,275,000
County debts,	168,000
City debts,	286,000
Record debt,	5,946,000
Total,	$9,005,000,

equivalent to one-fourth the property of the people. In Ohio, the same classes of debts reach an aggregate of $250,000,000, being also a little more than one-fourth of the property of the people. And in reference to this state of facts, the statistical commissioner of that state remarks, and the remark applies equally to Minnesota: "*No more conclusive proof can be given of the small amount of debt due by the people of Ohio,* (relatively to many communities,) than is furnished by these statistics." If the comparison is based upon population, Ohio owes $100 to each person, and Minnesota less than $34 to each person.

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APPENDIX.

TABLE I. Boundaries of Minnesota, 1860.

1st. Eastern.

	No. of miles.
From the north-east corner of the state of Iowa, along the Mississippi to mouth of St. Croix river,	133½
From the mouth of St. Croix to southern termination of imaginary line,	129¼
Whole length of the imaginary line, 40 miles, 75.84 chains,	41
From the north end of imaginary line to the "Entry" at Lake Superior,	23
From the Entry along the State boundaries in Lake Superior, (as shown on Owen's map,) to Pigeon Point,	160
	487

2d. Northern.

From Pigeon Point up Pigeon River and lakes, to dividing ridge, (head of Arrow river,)	70
From dividing ridge along chain of lakes to inlet of Rainy Lake,	150
From inlet to outlet of Rainy Lake,	40
Along Rainy Lake river to Lake of the Woods,	80
Across Lake of the Woods to commencement of imaginary line on west shore, (49° latitude,)	85
Along imaginary line due west to the Red river,	100
	475

3d. Western.

Along the channel of the Red river to mouth of Sioux Wood river,	380
" " " " Sioux Wood river to foot of Lake Travers,	40
Through centre of Lake Travers to the head,	15
From the head of Lake Travers to the head of Big Stone Lake,	4
From the head of Big Stone Lake along centre to foot, at outlet,	26
Imaginary line due south from foot of Big Stone Lake to Iowa line, 124 miles, 1.10 ch.,	124
	589

4th. Southern.

From intersection of western boundary line with the northern boundary of Iowa, due east on parallel of lat. 43° 30′, to the Mississippi river,	262
Total,	**1,813**

Summary.

Formed by large rivers, more or less navigable, being portions of the Mississippi, St. Croix, St. Louis, Rainy Lake and Red rivers,	746
Formed by imaginary lines, on land,	530
" " " " in Lake Superior,	160
Formed by lakes and small rivers not elsewhere mentioned,	376
	1,812

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TABLE II.—Approximate Areas of Counties in Minnesota.

Name.	Square Miles. Woodland.	Prairie.	Total.
Aiken,			720
Anoka,		10	428
Becker,			2,016
Benton,			406
Blue Earth,	206	†560	766
Breckenridge,			1,440
Brown,			3,351
Buchanan,			872
Carlton,			870
Carver,	†370	3	373
*Cass, (with triangular piece of 90 ms.,)			4,860
Chisago,			446
Cottonwood,			720
Crow Wing,			546
Dakota,	251	†328	579
Davis,			122
Dodge,	70	†362	432
Douglas,			720
Faribault,	6	†714	720
Fillmore,	594	270	864
Freeborn,	290	†430	720
Goodhue,	416	360	776
Hennepin,	†552	60	612
Houston,	†472	100	572
Isanti,			456
*Itasca			5,800
Jackson,			720
Kanabec,			528
Kandiyohi,			432
*Lake,			4,000
Le Sueur,	445	27	472
McLeod,	197	†247	444
Manomin,	14	2	16
Martin,			720
Meeker,			432
			37,951

Name.	Square Miles. Woodland.	Prairie.	Total
			37,951
Mille Lacs,			684
Monongalia,			432
Morrison,			628
Mower,	160	†548	708
Murray,			720
Nicollet,	50	†410	460
Nobles,			720
Olmsted,	247	413	660
Otter Tail,			2,016
*Pembina,			7,000
Pierce,			2,200
Pine,			556
Pipestone,			462
*Polk,			6,495
Ramsey,	154	2	156
Remille,			1,870
Rice,	†338	178	516
Ripley,			420
Rock,			456
*Saint Louis,			6,500
Scott,	†331	44	375
Sherburne,			445
Sibley,	165	†429	594
Stearns,			1,379
Steele,	†236	196	432
Todd,			1,464
Toombs,			1,010
Wabasha,	†375	165	540
Wadena,			540
Waseca,	108	324	432
Washington,	352	62	414
Watonuan,			432
Winona	514	124	638
Wright,			708
Nameless remnants,			1,698
Total (approximate area,)			81,259

TABLE III.

Table of Meteorological Observations, by Dr. C. L. Anderson, Minneapolis, for four years ending December 31st, 1859.

1856.	Extreme. Max.	Min.	Mean	1857.	Extreme. Max.	Min.	Mean	1858.	Extreme. Max.	Min.	Mean	1859.	Extreme. Max	Min.	Mean
Jan.	30	—30	1.00	Jan.	26	—38	5.40	Jan.	47	—20	22.96	Jan.	46	—21	14.26
Feb.	35	—22	9.09	Feb.	44	—39	14.00	Feb.	52	—20	13.64	Feb.	46	—18	20.88
March.	46	—20	27.14	March,	55	—21	26.25	March,	61	— 2	39.77	March,	47	20	34.25
April.	65	27	40.11	April,	70	0	33.87	April,	83	22	43.90	April,	75	15	38.60
May,	90	35	57.80	May,	86	20	48.09	May,	82	41	56.51	May,	85	34	59.90
June.	95	54	71.20	June,	92	44	69.03	June,	95	54	74.50	June,	90	37	65.13
July,	98	60	70.13	July,	98	60	79.51	July,	88	55	73.64	July,	98	51	76.06
Aug't.	93	44	69.70	Aug't.	88	50	70.46	Aug't.	90	50	73.00	Aug't.	92	53	70 93
Sept.	82	38	60.41	Sept.	90	33	63.20	Sept.	85	44	61.83	Sept.	79	35	58.66
Oct.	76	28	46.17	Oct.	75	20	48.85	Oct.	72	32	48.83	Oct.,	82	22	45.83
Nov.,	50	4	27.75	Nov.	50	—13	24.16	Nov.	44	3	29.86	Nov.,	70	0	31.50
Dec.,	32	—18	8.20	Dec.	40	5	26.45	Dec.	39	—22	19.14	Dec.,	45	—30	5.38
Year.	66.00	19.06	40.73	Year.	67.83	9.25	42.44	Year.	69.83	19.75	44.85	Year.	71.33	16.50	43.45

* Vague estimate.

† Includes open marshes.

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TABLE IV.—EXPORTS OF AGRICULTURAL AND OTHER PRODUCTS FOR THE YEAR ENDING JANUARY 1ST, 1858, AS REPORTED BY PRIVATE CORRESPONDENTS.

PLACE OF EXPORT.	Wheat, bushels.	Oats, bushels.	Corn, bushels	Barley, bushels	Potatoes bushels.	Cran's, bushels	Ginseng, pounds.	Hides & Skins	Wool, bales.	Furs.
St. Anthony & Min'apolis		13,000	33,000		46,000					
St. Paul,	12,848	30,000	5,376		50,000	4,000	128,000	4,500	24	$120,000
Taylor's falls		2,000			2,000	6,000				
Stillwater,	500	9,600			7,000	300				
Pt. Douglas,	6,000	6,000								
Hastings,	49,477	59,400			3,000		75,000	5,000	2,000	
Pine Bend,	3,000	1,000							lbs.	
Newport,		1,500								
Red Wing,	30,000	of all	grains,	princi	pally	wheat				
Lake City,	18,000				3,400					
Wabasha,	4,800	10,000			2,000			1,800		
Reed's L'ng,	3,000	5,000			1,000					
Minneiska,	12,000	of all	grains							
Mt. Vernon,	3,000	of all	grains							
Winona,	177,000	35,000		9,000	6,000					
La Crescent,	15,000	1,000	2,000		2,000			750		
Hokah,	3,000									
Brownsville,	32,000	4,000		1,000						
North Shore of L. Sup'ior,					1,000					$40,000
Total,	369,625	164,500	41,376	10,000	128,400	10,300	203,000	12,050		$160,000

TABLE V.—ESTIMATED EXPORTS OF LUMBER FOR THE YEAR 1859.

	Sawed lumber.	Laths.	Shingles.	Logs.	Long lumber.
St. Anthony,	3,000,000	4,100,000	5,200,000	31,000,000	9,490,993
St. Croix Valley,	30,000,000	15,000,000	1,000,000	40,000,000	
Wabasha,	13,000,000	2,886,000	563,000		
	46,000,000	21,886,000	6,763,000	71,000,000	9,490,993

Small lots of lumber went from other towns.

The lumber export stated for Wabasha was doubtless received from the Chippewa River, Wisconsin.

TABLE VI.—A DESCRIPTIVE LIST OF BONDS ISSUED BY THE MUNICIPALITIES.

STATEMENT "A." STATE BONDS.

Minnesota State Bonds.—A loan of $250,000 authorized by act of March 13th, 1858, for the defrayment of current expenses, for the first fiscal year, and for indebtedness already accrued; interest at 8 per cent., payable semi-annually; principal payable in nine years from date of loan.

Minnesota State Railroad Bonds.—A loan of state credit to the four land-grant railroad companies, under an amendment to Sec. 10, Art. 9 of the constitution, adopted April 15th, 1858, issued in 1858 and 1859, in the aggregate sum of $2,275,000, in denominations of $1,000; interest at 7 per cent. per annum, payable semi-annually; principal payable on Dec. 1st, 1863, or in 25 years from date of issue, but redeemable after 10 years from said date. The said bonds are made payable in the following sums respectively to the orders of the following companies respectively to which they were issued:

Southern Minnesota Railroad Company,	. . . .	$575,000
Minnesota and Pacific " "	. . . . .	600,000
Transit " "	. . . . .	500,000
Minneapolis and Cedar Valley "	. . . . .	600,000

For further particulars see "State Debt."

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STATEMENT B. County Bonds.

Goodhue County Bonds.—For building court-house and jail, in the sum of $25,850. Interest at 12 per cent. per annum, payable annually at the Metropolitan Bank, New York. Principal payable within ten years, in annual installments, as follows: $1,500 in 1861; $1,750 in 1862; $2,000 in 1863; and so increasing $250 each year for ten years.

Hennepin County Bonds.—$37,000 in all; for building a court-house; in two sums; the first of $20,000, issued Sept. 1st, 1856, at 12 per cent. per annum, payable semi-annually, at Wm. J. Bell & Co's., New York; principal payable in from six to ten years, at the American Exchange Bank; the second issue, made March 16th, 1858, in the sum of $17,000, interest payable semi-annually at American Exchange Bank, New York; principal payable as above. N. B. The coupons of these bonds are received in payment of county taxes.

Morrison County Bonds.—For building a court-house; in the sum of $8,000, issued Nov. 25th, 1856, by authority of Board of County Commissioners; interest 12 per cent. per annum, payable annually as the bonds become due; principal payable in installments as follows: $1,000 on Jan. 1st, 1860, and $1,000 annually thereafter. N. B. Neither principal nor interest of these bonds have been paid.

Ramsey County Bonds.—The bonds issued by Ramsey county amount in all to $88,000, and are in three classes, as follows:

1. *Court-House Bonds.*—Authorized by act of Legislature; issued to build a court-house, in the sum of $6,000, in denominations of $1,000; date of issue May 15th, 1854. Interest 10 per cent.; principal payable in 5, 6, 7, 8, 9 and 10 years from date of issue. These bonds were drawn in favor of D. L. Fuller.

2. *Jail Bonds.*—Issued by authority of an act of Legislature, to build a jail; total sum, $29,000, in denominations of $1,000, in two issues, one of $20,000, of date Oct. 1st, 1856; interest at 10 per cent., payable semi-annually, at New York; principal payable in sums of $2,000 in consecutive years; the first payment to be made in 5 years and the last in 14 years from date. The second issue made on June 1st, 1857, payable in sums of $5,000 in 5, 10 and 15 years.

3. Bonds issued by County Commissioners or Supervisors, without special authority of law, in lieu of current indebtedness. Under this head there have been issued, in all, $53,200, at various dates from Aug. 20th, 1858, to March 6th, 1860, in the following denominations: 350 bonds of $100 each, and 37 of $500 each, payable from 2 to 6 years from date of issue; interest, generally, 10 per cent.

Scott County Bonds.—For building a court-house; issued July 30th, 1851, under a special act of the Legislature, in the sum of $7,000, in denominations of $1,000, interest 12 per cent.; principal payable at Bank of North America, New York, on Sept. 1st, 1872. N. B. The auditor does not state whether these bonds are payable in installments.

Wabasha County Orders.—$475 outstanding and bearing interest at 2 per cent. per month. No time of payment specified. The issue is unauthorized by law.

Waseca County Bonds.—Issued in 1859, under a special act of the Legislature, to cover the county indebtedness, in the sum of $2,710; interest at 15 per cent., payable annually on March 1st; principal payable March 1st, 1862.

Wright County Bonds.—For building a jail; issued under an act of the Legislature, on Oct. 3d and 11th, 1859, in the sum of $1,500, in denominations of $100, $25, $10 and $5; interest 12 per cent. per annum, payable annually at Monticello. Of the principal, one-half is due Feb. 15th, 1861, and one-half Feb. 15th, 1862.

Total amount of county bonds issued, as reported by the county auditors, $167,825.

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STATEMENT C.—City Bonds.

Saint Paul.—No report from the treasurer under this head. From table of city finances, we compile the following general facts:

The City of St. Paul has issued its bonds to the amount, in all, of $265,070.41 in eight classes, as follows—their several descriptions expressing the objects for which they were appropriated:

(1.) *Levee Bonds.*—$48,424.47 issued as follows: $30,000 in 1856; $10,511.32 in 1858, and $7,913.15 in 1859. (2.) *Bridge Bonds*, $100,000, issued as follows: $25,000 in 1857, and $75,000 in 1858. (3.) *Sewer Bonds*, $20,980.21, issued as follows: $20,380 in 1857, and $600.21 in 1858. (4.) *Market Bonds*, for the purchase of a market house, $25,000 in 1858. (5.) *Revenue Bonds*, $41,539.81 in 1858. (6.) *Improvement Bonds*, $16,625.92, issued as follows: $5,740.42 in 1858, and $10,885.50 in 1859. (7.) *Engine Bonds*, $5,000 in 1858. (8.) *Board of Education*, $7,500 in 1858.

St. Anthony Bonds.—To purchase fire engines, $6,247.75, issued in 1859, in denominations of $50 and $100; interest at 10 per cent. payable semi-annually, at American Exchange Bank, N. Y. Principal payable in 1, 2, 3, and 4 years.

Stillwater Bonds.—For building levee and city hall, $13,940.00 issued from December 1858, to January 1860, in denominations from $100 to $1,200; interest at 10 per cent. payable semi-annually at Bank of America. Principal payable twenty years after date.

Total amount of City Bonds issued in Minnesota, . . $285,158.16

TABLE VII. County Finances.

County.	Amount of annual Expenditures.	Am'nt of county orders outstanding Jan. 1, 1860.	Total debt of county Jan. 1, 1860.	Delinquent tax unpaid Jan. 1, 1860.
Anoka,	6,863.00	5,180.00	5,180.00	10,323.00
Brown,	4,574.73	4,565.07	6,665.07	537.45
Blue Earth,	7,224.40	10,027.80	13,629.00	17,785.18
Chisago,	3,559.00	2,807.46	7,798.96	3,414.10
Dakota,	11,338.80	6,872.25	21,411.58	52,659.64
Dodge,	3,569.27	2,274.97	950.51	8,230.59
Faribault,	1,490.68	1,248.45	1,472.15	582.36
Freeborn,	2,500.00	2,143.97	2,143.97	4,511.64
Fillmore,	8,105.81	13,422.15	8,916.41	7,969.83
Goodhue,	17,000.00	20,000.00	*56,710.30	11,710.30
Hennepin,	27,930.38	20,000.00	49,000.00	no report.
Houston,	8,924.72			8,497.65
Le Sueur,	4,018.19	2,500.00	2,500.00	6,554.94
Meeker,	1,375.26	1,543.63	2,010.22	807.93
Morrison,	1,856.25	2,500.00	25,851.64	17,102.06
Olmsted,	8,700.00	1,200.00	600.00	3,567.00
Rice,	15,384.62	7,693.61	34,262.41	30,001.77
Steele,	5,185.33	3,207.65	3,207.65	9,220.51
Sibley,	2,461.00	1,421.75	1,421.75	6,040.10
Scott,	5,662.20	7,000.00	7,000.00	12,887.00
Sherburne,	1,051.59	1,615.35	1,615.12	1,397.92
Wright,	4,618.83	4,129.14	4,618.83	2,804.38
Waseca,	5,928.07		2,710.00	4,548.38
Washington,	11,987.88	7,591.06	29,109.24	12,777.84
Winona,	14,200.24	10,880.42	40,726.79	42,306.80
Wabasha,	7,814.50	5,359.06	7,951.23	20,331.00
Totals,	†188,106.67	145,183.79	337,462.85	†286,566.37

* $45,000 debt over assets less tax of 1859.

† These totals are greater than those quoted in the text by the addition of Hennepin Co.

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TABLE VIII., SHOWING THE APPRAISED VALUATION OF REAL ESTATE AND PERSONAL PROPERTY AND THE TAXES LEVIED THEREON.

COUNTIES.	Assessed Valuation of Real Estate.	Assessed valuation of Personal Property.	Total Assessed Valuation.	Amount of State Tax at 5 mills per dollar.	Amount of School tax at 2 1-2 m. per dollar.	Rate of Co Tax, mills	Rate of Total Tax.	Whole Amount of Taxation.
Anoka,	$442,407.00	$67,357.00	$509,564.00	$2,547.00	$1,273.50	5	0125	$8,779.31
Benton,	283,355.00	27,699.00	311,054.00	1,555.27	777.63		021	6,759.06
Brown,	154,499.00	114,454.00	268,953.00	1,344.76	672.38	10	0175	4,706.67
Blue Earth,	587,392.28	215,432.00	802,824.28	4,014.12	2,007.06	15	03	24,084.73
Carver,			418,112.92	2,090.56	1,045.28	7½	02	8,362.24
Chisago,	511,205.00	45,094.00	556,299.00	2,781.49	1,390.74	5	008	10,879.00
Dakota,	1,429,640.50	237,702.00	1,667,342.50	8,338.75	4,169.38	7½	018	35,154.27
Dodge,	531,308.00	84,078.00	565,386.00	2,829.00	1,414.50	5½	015	8,219.67
Faribault,	216,257.00	67,779.00	284,036.00	1,420.19	710.09	7½	015	4,260.57
Fillmore,	1,175,496.00	382,991.00	1,558,487.00	7,796.96	3,898.48	5		22,441.11
Freeborn,	280,300.72	111,309.70	391,610.42	1,962.46	981.23	7½	018	7,525.74
Goodhue,	1,233,352.63	271,971.32	1,505,323.95	7,951.96	3,975.98	11½	016	32,886.21
Houston,	969,990.86	158,213.29	1,128,204.14	5,641.02	2,820.51	4	016	18,051.26
Hennepin,	3,171,460.89	482,709.00	3,657,169.90	18,270.84	9,135.42		0125	52,111.21
Le Sueur,	361,262.00	142,663.00	523,926.00	2,619.00	1,309.50	10		12,629.00
Meeker,	143,619.35	42,097.50	185,717.85	854.10	427.05	5½	017	3,235.00
Morrison,	525,060.14	48,631.30	575,691.74	2,868.45	1,434.22	10	0195	11,186.98
Olmsted,	1,050,672.00	75,024.00	1,125,696.00	5,628.00	2,814.00	5	018	20,000.00
Pine,	483,386.35	5,386.00	488,772.35	2,443.86	1,221.93	8	015	7,331 46
Ramsey,	6,029,918.00	860,050.00	6,889,968.00	34,449.00	17,224.50	10		
Rice,	1,095,307.00	303,325.00	1,398,632.00	7,021.38	3,510.69	5	0157	21,969.12
Steele,	420,585.81	72,453.75	493,039.56	2,465.19	1,232.59	3½	0083	4,108.66
Sibley,	213,227.00	97,340.00	310,567.00	1,552.84	776.42	7½	0206	6,406.45
Sherburne,	266,537.75	33,974 50	300,512.25	1,503.06	751.53	10	0219	6,220 12
Scott,	581,515.00	185,618.00	767,133.00	3,835.68	1,917.84	7½	015	12,962.75
Wright,	311,453.31	174,880.05	486,283.36	2,373.62	1,186.81	7½	0155	8,817.83
Waseca,	226,190.00	75,389.97	301,579.97	1,504.35	752.18	13½	0268	8,087.83
Washington	2,023,349.00	267,300.00	2,290,648.00	11,547.32	5,773.66	5	013	28,396.09
Winona,	1,167,432.00	971,120.00	2,138,552.00	10,692.76	5,346.38	4½	008	25,662.62
Wabasha,	764,785.00	209,161.00	973,946.00	4,869.73	2,434.86	8½	0186	17,240.00
					Average tax of thirty counties,		0175	383,373.19

No report from McLeod, Nicollet, Stearns, and others. The town and road tax being only reported in a few instances are not tabulated above.

Appraised Valuations of Remaining Counties as Reported to the Auditor.

Kanabec,	$90,971.04	Martin,	$30,970.54
Kandiyohi,	19,500.48	Mower,	826,529.00
McLeod,	254,733.93	Nicollet,	763,549.00
Manomin,	54,117.00	St. Louis,	96,836.76
Mille Lacs,	182,494.00	Stearns,	383,[illegible]14.00

Total valuation of property in 1859, $35,564,492.70. No report from Crow Wing and Isanti. The table referred to in the text, giving a progressive exhibit of the county valuations since 1849, is necessarily omitted.

TABLE IX.—AGGREGATES OF VOTES CAST IN MINNESOTA AT THE GENERAL ELECTION, HELD OCT. 13TH, 1857.

CONSTITUTION—for, 30,075; against, 571. GOVERNOR—*H. H. Sibley*, 17,790; Alexander Ramsey, 17,550. LIEUTENANT-GOVERNOR—*W. C. Holcombe*, 18,210; J. C. Ide, 17,055. SECRETARY OF STATE—*F. Baasen*, 18,172; L. K. Stannard, 17,115. TREASURER—*G. W. Armstrong*, 18,121; F. Manton, 17,071. AUDITOR—*William F. Dunbar*, 18,218; A. P. Lane, 17,026. ATTORNEY-GENERAL—*C. H. Berry*, 17,703; G. A. Nourse, 16,804. CHIEF JUSTICE—*L. Emmett*, 18,169; H. R. Bigelow, 17,173. ASSOCIATE JUSTICES—*J. Atwater*, 18,199; *C. E. Flandrau*, 18,110; J. M. Berry, 17,052; H. A. Billing, 17,026. CLERK SUPREME COURT—*J. J. Noah*, 18,136; A. B. Russel, 17,015. MEMBERS UNITED STATES HOUSE OF REPRESENTATIVES—*G. L. Becker*,* 18,019; *W. W. Phelps*, 18,218; *J.*

* G. L. Becker was elected by the people but was excluded from his seat by the apportionment law, which limited the representation to two members.

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M. Cavanaugh, 18,064; M. S. Wilkinson, 16,938; H. A. Swift, 16,937; C. Aldrich, 16,955.

The italics designate democrats; the roman, republicans.

TABLE X.—OFFICIAL VOTE, STATE CANVASS, ELECTION HELD OCTOBER 11, 1859.

COUNTIES.	GOV'NR.		LT. GOV.		S. STATE.		TREAS.		A'Y GEN.		MEMB'RS OF CON.			
	rep	dem	rep	dem	rep	dem	rep	dem	rep	dem	rep	rep	dem	dem
	Ramsey.	Becker.	Donnelly.	Lowry.	Baker.	Baasen.	Scheffer.	Abbey.	Cole.	Brisbin.	Aldrich.	Windam.	Cavanaugh.	Graham.
Anoka,	383	165	325	225	328	218	328	322	324	226	329	328	222	222
Benton,	143	94	139	94	136	99	143	83	139	98	146	138	86	93
Blue Earth,	734	560	730	561	712	572	735	554	743	549	732	728	566	563
Brown,	343	300	344	298	296	345	344	297	334	306	336	326	303	308
Carver,	473	524	466	531	408	586	469	526	459	539	463	455	530	541
Chisago,	284	156	279	156	282	156	281	154	283	156	288	283	156	156
Crow Wing,	8	55	8	54	4	58	3	57	4	58	5	4	59	58
Dakota,	1007	1056	984	136	984	1075	1004	1054	1003	1054	1004	977	1072	1073
Dodge,	593	444	583	449	583	451	586	451	586	449	582	575	466	451
Faribault,	210	109	207	109	210	109	209	110	210	109	209	206	107	109
Fillmore,	1399	1171	1398	1170	1371	1171	1399	1171	1403	1163	1388	1366	1228	1170
Freeborn,	438	227	432	230	433	231	434	219	433	231	433	427	239	230
Goodhue,	1220	706	1183	718	1201	714	1216	710	1216	709	1198	1211	712	730
Hennepin,	2013	1117	1997	1128	1980	1137	2050	1042	2050	1069	2164	1984	1126	957
Houston,	675	716	668	717	674	715	673	714	674	717	672	677	720	710
Jackson,	21	18	21	18	20	19	21	18	21	18	20	20	20	18
Kanabec,	9	6	9	6	9	6	9	6	9	6	9	9	6	6
Kandiyohi,	19	3	19	3	19	3	19	3	19	3	19	19	3	3
Le Sueur,	577	625	578	624	567	631	577	624	576	625	578	575	625	621
Martin,	18	10	18	10	18	10	18	10	18	10	18	18	10	10
McLeod,	197	95	194	97	187	97	196	95	195	96	196	194	94	96
Meeker,	147	103	145	102	147	103	147	103	147	104	147	145	104	103
Monongalia,	47	30	47	30	47	30	47	30	47	30	47	47	30	30
Morrison,	88	115	87	*	87	116	85	116	88	115	88	87	117	116
Mower,	412	227	414	227	416	224	416	224	415	221	414	415	189	190
Nicollet,	424	488	422	485	409	495	426	485	424	486	424	419	488	487
Olmsted,	1119	777	1116	777	1110	777	1115	777	1120	742	1124	1120	732	769
Pine,	6	28	3	31	2	32	28	6	3	31	3	3	31	31
Ramsey,	1485	1773	1489	1745	1407	1837	1566	1664	1473	1782	1523	1491	1729	1755
Renville,	8	37	8	37	8	37	8	37	8	37	8	8	37	37
Rice,	1045	828	1014	834	1032	839	1035	834	1037	832	1041	1040	832	834
Scott,	552	917	530	943	517	952	525	938	517	948	522	517	947	954
Sherburne,	131	68	130	69	127	73	127	70	127	73	128	126	71	72
Sibley,	303	526	294	535	290	538	293	534	293	532	286	287	538	544
Stearns,	375	660	366	656	365	667	375	656	370	663	396	369	635	656
Steele,	448	178	441	178	445	179	448	177	446	178	447	449	176	175
Wabasha,	793	512	773	513	748	553	792	510	795	510	783	791	502	506
Waseca,	359	254	358	255	356	257	359	255	354	255	359	357	254	254
Washington,	953	707	942	717	939	719	957	696	949	712	946	948	717	713
Winona,	1209	814	1100	916	1207	816	1217	809	1217	802	1214	1217	804	796
Wright,	579	265	576	265	571	271	575	265	577	265	595	579	263	246
Carlton, St. Louis & Lake,	88	119	80	121	80	121	80	119	80	121	81	81	120	121
Total.	21,335	17,562	20,917	17,670	20,732	18,039	21,335	17,425	21,186	17,630	21,360	21,016	17,668	17,417

* Official vote as returned gives "for Secretary of State," S. B. Lowry, 116 votes. Scattering, 9 votes.

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TABLE XI.—CONDITION OF THE PUBLIC SCHOOLS.

County.	No. of School Districts.	No. of Schools.	No. of Scholars.	No. of Schoolable Persons.	Amount of County School Tax.
Anoka,	14	14	619	619	$1,273.68
Benton,	5	4	—	223	411.18
Brown,	9	4	—	468	672.38
Blue Earth,	26	26	1,165	1,165	2,207.67
Chisago,	13	14	—	524	1,390.75
Dakota,	49	—	—	2,563	4,132.13
Dodge,	32	32	998	1,175	1,413.46
Faribault,	20	—	—	309	710.07
Fillmore,	79	—	—	3,545	3,896.21
Freeborn,	45	33	—	793	983.10
Goodhue,	44	44	—	2,160	3,763.20
Hennepin,	77	52	3,000	3,437	9,142.92
Houston,	45	65	889	1,809	2,511.62
Le Sueur,	29	47	1,046	1,047	1,308.79
Meeker,	9	14.	237	237	465.27
McLeod,	3	3	—	159	636.83
Morrison,	3	3	128	174	1,432.22
Olmsted,	89	87	2,500	2,500	2,814.00
Pine,	1	0	0	18	1,177.48
Ramsey,	11	12	1,000	3,420	17,224.00
Rice,	54	—	—	2,046	3,510.52
Scott,	30	30	1,367	1,367	1,917.85
Sibley,	26	14	319	974	776.12
Sherburne,	12	9	—	215	751.52
Steele,	32	—	—	926	2,546.44
Wabasha,	42	42	—	1,907	2,437.45
Waseca,	28	15	—	494	752.18
Washington,	24	29	930	1,635	5,719.69
Winona,	50	50	—	2,368	5,346.37
Wright,	27	26	756	756	1,186.87
	938	672	14,954	39,033	82,511.97

TABLE XII.—A PROGRESSIVE EXHIBIT OF THE FINANCES OF THE CITIES.

Finances of St. Paul.

Year.	Value of Real Estate. Town Lots.	Value of Real Estate. Lands.	Value of Personal Property.	Total Value.	Rate Tax in Mills.	Amount of Tax Levied.
1853				$72,673.20	5	$3,633.66
1854				1,365,685.00	8½	12,279.89
1855	$1,656,797.00	$210,450.00	$513,228.00	2,380,467.00	8	18,430.83
1856	3,009,225.00	268,225.00	549,315.00	3,826,765.00	9½	36,926.60
1857	5,791,585.00	645,650.00	1,197,400.00	7,634,635.00	9	73,118.10
1858	3,464,700.00		579,609.00	4,044,389.00	17	68,133.09
1859	4,955,984.00		815,217.00	5,771,201.00	15	87,382.03

	Receipts.	Salaries.	Expenses.*	Expenditures for Improvements.	Total Expenditures.
1856,	$71,888	$11,560.10	$24,981.97	$34,868.87	$71,410.94
1857,	156,419.07	10,693	82,540.03	93,243.60	186,496.63
1858,	254,895.40	15,800	75,772.33	156,292.03	247,864.36
1859,	96,812.23	9,465.40	42,167.75	27,917.57	79,555.72

* For police, gas, city hall, prison, fire department, ward, and other expenses.

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Assets.

Taxes from 1853 to 1859 inclusive,	$141,343.45
Certificates for improvements owned by city,	24,966.50
Amount due from St. Paul Bridge Company,	107,540.90
Delinquent personal taxes,	9,474.15
City property, (other assets $104.79,)	49,599.41
Total assets,	$332,925.41

Liabilities.

Outstanding orders,	$11,250.38
Due for money borrowed,	13,700.00
Due sundries,	24,488.24
Funded debt, see table "City Bonds,"	208,876.93
Revenue and improvement bonds,	47,238.03
Total liabilities,	$305,553.58

Finances of the City of St. Anthony.

	Valuation of Property.	Amount of City Tax.	Rate per dol.	Whole Expenditures.	For Improvements.	For Salaries.	Receipts.
1857,	$2,446,800	$12,234	5	$10,126.85	$7,693.70	$2,433.15	$6,742.17
1858,	2,560,700	12,803.50	5	15,465.72	9,822.52	5,643.20	12,641.21
1859,	1,107,741	11,077.40	10	9,822.52	4,303.43	1,512.79	6,668.10

Liabilities, January 1st, 1860, $10,984.85; assets, $15,963.56. See city bonds.

Finances of the City of Stillwater.

1858,	757,660	3,030.56	4				
1859,	788,110	5,516.77	7	3,584.42	167.36	3,416.96	5,884.56

Liabilities, January 1st, 1860, $26,922; assets, $7,300.

Finances of the City of Winona.

1857,	1,658,960	8,294.80	5	5,935.55	3,612.64	2,322.91	2,993.24
1858,	1,589,093	4,767.30	3	4,153.42	1,579.48	2,573.94	3,264.60
1859,	not assessed.	none.		2,240.22	940.67	1,299.55	1,054.68

Liabilities, January 1st, 1860, $5,556.33; assets, tax due, $6,474.

Finances of the City of Hastings.

1858,	751,797	7,517	1	1,300	600	700	5,043
1859,	362,735	3,627.35	1	3,700	3,400	300	2,492

Liabilities, outstanding scrip, $4,785; assets, taxes due, $4,561.

Finances of the City of Rochester.

1858,	368,560	1,071.23	4 1-10*	141			
1859,	196,823.50	1,507.86	5½*	334			292

XIII. General Statistics of Churches.

The names and stations of ministers, and the statistics of churches in detail, are necessarily omitted.

Catholics.—Churches built, 31, under construction, 17; missions and stations, 93; clergymen, 27; communities of men, 2, of sisters, 5. Female academies, 4. Catholic population, about 50,000.—*From Catholic Almanac of* 1859.

Free Presbyterians.—Number of ministers, 20; churches, 18; members, 669.

Old School Presbyterians.—Number of ministers, 12; churches, 14; members, 361; added in 1859, 112; number of sabbath schools, 12; scholars, 495.

Methodist Episcopal Church.—Conference organized at Red Wing, August, 1856. Number of districts, 8; appointments, 106; traveling preachers, 107; local preachers, 108; members, 4,542; probationers, 1,616; churches, 24; parsonages, 7; Sunday schools, 139; Sunday school scholars, 4,420; Sunday school officers and teachers, 1,014; volumes in libraries, 13,374; children converted, 52; Sunday school papers taken, 1,747. Salaries of preachers, $16,352. Actual receipts, $10,477. Valuation of church property, $56,750.

* Of this, the special school tax was 2 4-5 mills in 1858, and 3 mills in 1859.

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Progressive Statistics for Four Years.

	1856.	1857.	1858.	1859.
Districts,	4	6	7	8
Appointments,	57	72	91	106
Traveling preachers, (including those on trial,)	47	63	77	107
Local preachers,	44	86	88	108
Churches,	6	13	16	24
Parsonages,	2	3	3	7
Members,	1,364	2,209	3,029	4,542
Probationers,	323	657	1,597	1,616
Preachers located,	1	6	3	—
Deaths,	—	—	19	62
Sunday schools,	24	55	49	139
Officers and teachers,	191	434	426	1,014
Sunday school scholars,	851	1,961	1,993	4,420
Volumes in library,	3,741	6,862	5,667	13,374
Conversions of children,	25	—	—	52
Salaries of preachers received,	$7,540	$16,804	$16,288	$10,477

German Methodist.—Number of members, 841; schools, 17; scholars, 413.

	Churches.	Members.
Baptist.—Minnesota Baptist Association,	33	1,028
Southern Minnesota "	21	547
Central Minnesota "	10	224
Minnesota valley "	7	102
Unassociated churches,	4	46
Total Baptist churches,	75	Total members, 1,947

Lutherans.—Number of churches, 18; ministers, 18.

Congregational.—Number of churches, 51; members, 1,446; number added in 1858–9, 427; male members, 405; female members, 651; average number members of congregations 4,050; Sunday school scholars, 1841; members removed by death, 13; by expulsion, 1; by letter, 66. Total removals, 77.

Episcopalian.—Number of baptisms, 186; confirmations, 104; added anew, 42; by transfer, 75; died, 3; removed, 66; whole number of communicants, 588; marriages, 34; burials, 46; Sunday school scholars, 474.

Universalists.—Four congregations; one society; four ministers; one Sunday school; eighty scholars.

TABLE XIV.—POST-OFFICE STATISTICS.

	Whole number offices in Minnesota.	Letter postage.	Newspaper postage.	Stamps sold.	Registered letters.	Gross revenue.	Cost transportation.
1849	9	$85.08	$5.60			$90.68	
1850		1,496.53	320.03			1,816.56	
1851	20	2,846.24	574.12	$130		3,550.36	$1,192.89
1852		1,476.37	787.62	1,034		3,297.99	2,500.36
1853	43	1,630.11	560 84	1,338.91		3,529.86	2,386.28
1854		2,696.26	809.18	2,297.23		5,802.67	7,423.74
1855	84	5,681.71	1,160.35	4,245.04		11,087.10	13,818.70
1856		7,038.43	2,241.05	13,858.90	$198.65	23,337.03	31,830.17
1857	285	8,056.07	3,996.10	31,395.04	368.50	43,815.71	38,128.75
1858		8,335.20	5,002.59	38,218.52	225.15	51,781.46	87,757.06
1859	525	6,650.59	4,837.65	37,095.46	165.55	48,749.25	171,511.84

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TABLE XV.—PROGRESSIVE STATISTICS OF THE UNITED STATES LAND OFFICES IN MINNESOTA.

(1.) *Cambridge Land District.*—Office, Cambridge, Isanti County. *Register*, H. N. Setzer. *Receiver*, C. C. Wagner.

History.—Chippewa Land District established 1847. Office, St. Croix Falls. First sale of public lands in what is now Minnesota, took place here, September 1848, when the town sites of St. Paul, St. Anthony, and Stillwater, were entered, 436,737 acres offered, 3,326 acres sold. Stillwater district, including all ceded lands east of Mississippi, established March 2d, 1849, with office at Stillwater. Office removed from Stillwater to Cambridge, November 15th, 1858.

Boundaries.—The district includes all that portion of Minnesota lying north and east of the Mississippi, and east of the line between ranges 27 and 28. and south of the line between townships 45 and 46.

Land Office Transactions.

Year.	Whole No. of Acres Sold.	Acres covered with Land Warrants.	Acres covered by Half Breed Scrip.	Amount rec'd in Cash.
1848,	15,381.38	7,426.51	———	$9,943.51
1849,	16,785.91	14,742.13	———	2,554.72
1850,	36,709.10	32,950.09	———	4,698.76
1851,	34,915.53	20,862.64	———	17,553.61
1852,	32,893.28	28,751.82	———	5,051.80
1853,	72,079.46	36,572.23	———	44,383.97
1854,	191,044.86	17,222.71	———	218,296.44
1855,	180,413.80	56,484.85	———	154,861.83
1856,	430,833.97	376,709.11	———	67,556.07
1857,	103,222.29	101,452.68	1.378.48	6,772.66½
1858,	13,791.24	6,394.89	6.895.62	625.91½
1859,*	3,000.00	2,000.00	1.000.00	———
	1.136.970.82	701.569.19	9.274.10	$532,299.29

(2.) *Saint Cloud Land District.*—Office St. Cloud, Stearns Co. *Register*, Wm. A. Caruthers. *Receiver*, S. L. Hayes.

History.—The original Sauk Rapids Land District was established in 1853, from the western portion of the Stillwater district. By the act of 1854, creating new land districts in Minnesota, this district was extended west of the Mississippi. Office removed to St. Cloud, 1858.

Present Boundaries.—District commences S. E. corner of township 32, north range, 28 west, 4th meridian, and runs N. on town line to N. E corner of T. 45, N. R. 28 W. thence west to Mississippi river, thence down said river to its junction with Crow Wing river, thence west to N. W. corner of T. 132, N. R. 31, W. 5th meridian, thence W. on town line to state line, thence S. with said line to S. W. corner of T. 121, R. 46, W. 5th meridian, thence E. on town line to S. E. corner of T. 121, N. R. 25 W., thence N. to Mississippi river.

Land Office Transactions up to Dec. 14th, 1859.

Year.	Total acres sold.	Acres covered with land warrants.	Ac's cov'd by Sioux H'lf Breed scrip.	Amount received in cash.
1853,	3,994.80	1,640.00		$2,943.50
1854,	27,512.79	2,960.00		30,690.98
1855,	64,499.50	19,600.00		56,692.15
1856,	193,811.53	By private sale. 171,600.00		27,764.41
1857,	49,934.25	43,000.00		8,667.71
1858,	27,275.50	25,720.00		1,444.37
1859,	22,425.53	20,560.00	680	2,480.43
Totals,	389,453.90	285,080	680	130,683.55

Area of district, 4,861,440 acres; area surveyed, 3,396,960 acres. On the east side of the Mississippi, sold at private sale, 483,840 acres; on the east side,

* Estimated.

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subject to preemption, 639,277 acres. Railroad lands in this district, subject to private entry, at $2.50 per acre, 28,893 acres.

(3.) *Forest City Land District.*—Office, Forest City, Wright Co. *Register*, Dr. Thomas E. Massey. *Receiver*, J. D. Evans.

History.—District created by Congressional act of March, 1854; Office at Minneapolis; commenced operations October, 1854. Office removed to Forest City in 1857.

Boundaries.—Extends from the Mississippi to the western boundary of the state, its southern limits being formed by the northern limits of Henderson district; northern by the line between townships 120 and 121, running from the western boundary of the state to the line between ranges 24 and 25, thence north to the Mississippi river, (i. e. it includes fractional townships 121 of ranges 22, 23 and 24.)

Office Transactions.

	No. acres appropriated.	No. of acres sold for cash.	No. of acres covered with land war'nts.	No. of acres. cov'd with Sioux Half Breed scrip.	Cash received.
1854, (3 months,)	12,876.04	12,876.04			$16,093.81
1855,	147,955.80	137,195.80	10,760		183,676.17
1856,	128,597	50,524	78,072		63,155
1857,	153,067	18,545	134,522		23,181
1858,	73,007.59	2,948	38,291	31,768.59	3,685
1859, to Dec. 1,	27,352	2,212.88	25,139.14		2,993.11
	542,855.43	224,301.72	286,784.14	31,768.59	292,784.09

There is a slight discrepancy in the total number of acres appropriated according to this statement, compiled, except for 1859, from the Pioneer and Democrat, and the aggregate given by the Register as follows: area of district in acres, (estimated,) 3,000,000; area surveyed in acres, 2,108,160; number of acres appropriated, 550,047 82-100; do. subject to preemption, 1,548,112.18; do. do. private entry, 143,489.95; number of declaratory statements filed, 8,160.

(4.) *Henderson Land District.*—Office Henderson, Sibley Co. *Register*, James C. Dow. *Receiver*, Christopher Graham.

History.—One of the four districts created by act of Congress, in 1854. Office originally at Red Wing, where it was opened February, 1855. Removed to Henderson in 1857.

Boundaries.—The district extends from the Mississippi to the western boundary of the state, the southern boundary being formed by the line between townships 110 and 111, and terminating on the Mississippi, about one mile below Wabasha City; the northern by the line between townships 115 and 116, running east from the west boundary of state to the intersection of said township line with the west line of township 27, range 24; thence eastward along the west and south lines of said township and the south lines of township 27, range 23 and 22, to the Mississippi river.

Office Transactions.

	Whole No. acres sold.	No. of acres cov'd by land warrants.	No. of acres cov'd by Half Breed scrip.	Amount rec'd in cash.
1855,	196,390.69	43,068		$204,752.99
1856,	324,380.75	241,555.75		103,531.46
1857,	307,784.32	208,720.12	59,779.68	49,005.62
1858,	107,556.81	87,750.21	14,147.31	7,074.01
1859,	65,401	61,800	2,000	2,000.25
Totals,	1,001,513.57	642,894.08	75,926.99	$366,364.33

Whole surveyed area of district in acres, 3,148,800; number of acres appropriated, *997,513.57; number of acres subject to preemption, *2151,286.43; number of acres subjeet to private entry, 2,960 acres.

* These amounts are thus stated for the sake of conformity with the table, in which that part of the statement from 1855 to 1858, inclusive, is compiled from the reports published in the St. Paul Pioneer and Democrat. The Register, in answer to my inquiries, states the aggregate number of acres appropriated at 960,415 acres, and consequently the number of acres open to preemption at 2,188,285 acres, an error in one statement or the other of 41,098 acres.

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(5.) *Saint Peter Land District.*—Office Saint Peter, Nicollet County. *Register*, Samuel Plummer. *Receiver*, B. F. Tillotson.

History.—Created by act of congress 1854. Office at Winona. Commenced operations January, 1855. Office removed to Faribault, in 1857, thence to Saint Peter in 1858.

Boundaries.—Extends from the Mississippi river to the western boundary of the state, bounded on the south by the line between townships 105 and 106, and on the north by the line between townships 110 and 111.

Office Transactions.

Year.	Whole No. of Acres Sold.	Acres covered with Land Warrants.	Acres covered by Half Breed Scrip.	Amount rec'd in Cash.
1855,	218,266.37	47,340		$218,527.12
1856,	609,412.52	444,360		206,315.65
1857,	558,554.76	491,280	38,722	35,690.95
1858,	141,490.01	122,640	13,620	6,801.70
1859,	34,648.00	32,500	1,428	900.00
	1,562,371.66	1,138,120	53,770	$468,235.42

Whole area of district, 4,585,600 acres. Surveyed area, 3,318,400 acres. Number acres sold, 1,562,371 66-100. Number acres located with land warrants, 1,138,120. Number of acres located with half-breed scrip, 53,370. Number acres open to preemption, 1,756,028.34.

(6.) *Chatfield Land District.*—Office, Chatfield, Fillmore County. *Register*, Jno. R. Bennett. *Receiver*, John H. McKenney.

History.—District created by act of congress, 1854. Office originally at Brownsville, Houston County. Opened August, 1854. Removed to Chatfield in 1856.

Boundaries.—The district extends from the Mississippi river to the western boundary of the state—its southern boundary being formed by the northern boundary line of Iowa—and its northern boundary by the line between townships 105 and 106.

Office Transactions.

Year.	Whole No. of Acres Sold.	Covered with Land Warrants.	Cash Receiv'd.
1854, 5 months,	82,414.07	1,960.00	$103,018.12
1855,	325,146.33	81,680.00	304,332.91
1856,	647,262.41	568,092.98	130,104.65
1857,	286,689.08	270,900.00	19,736.65
1858,	104,378.21	98,841.00	5,537.21
1859,* estimated,	26,094.00	24,710.25	791.03
Total,	1,471,984.10	1,046,184.23	$563,520.27

(7.) *North-eastern Land District.*—Office, Portland, north shore Lake Superior. *Register*, Samuel Clark. *Receiver*, John Whipple.

History.—Established in 1857. Office at Buchanan, St. Louis County, on north shore. Opened December, 1857. Removed to Portland in 1859.

Boundaries.—Includes all that portion of Minnesota lying north of a line dividing townships 45 and 46; north of base line east of Mississippi river, and east of line dividing ranges 23 and 24 west of 4th principal meridian.

Area of District.—Estimated 3,000,000 acres.

Office Transactions.

Year.	Whole No. of Acres Sold.	Covered with Land Warrants.	Sold for Cash.	For Half-Breed Certificates.	Cash rec'd.
1857,	4,182.70	3,681.26	501.44	———	$626.80
1858,	15,357.08	11,381.46	1,375.62	2,600	85.63
1859, (1 qr.)	2,416.04	627.52	68.52	1,720	85.65
	21,955.82	15,690.24	1,945.58	4,320	$2,481.97

* No statement for 1859 could be obtained from the office of this district. The above estimate is made by assuming for 1859, the same proportion of sales as in the adjoining district of Saint Peter, or about one quarter of the amount of 1858, and about one-seventh of cash receipts.

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Area of land now surveyed, 529,920 acres. Amount appropriated, 21,955 acres. Open to preemption, 507,965 acres.

(8.) *North-western Land District.*—Office, Otter Tail City. *Register*, Oscar Taylor. *Receiver*, Wm. Sawyer.

History.—District established July 8th, 1856. Office first opened at Ojibway, on Crow Wing river, afterwards removed to Otter Tail City, where it was opened August 1st, 1859.

Boundaries.—The district includes all that portion of Minnesota lying north of northern boundaries of the St. Cloud and Cambridge districts, and west of the north-eastern districts, (its south-east corner being the south-east corner of T. 46, R. 22.)

Office Transactions.

1859, Appropriated up to December 1st,	by Sioux Half-Breed Scrip,	8,680	acres.
" "	by Land Warrants, .	273	"
" "	by Cash, ...	53	"
	Total, ...	9,006	acres.

"Application," says the receiver, December 1st, 1859, "has been made for locating some 14,000 acres with Sioux scrip. Most of the locations of Sioux scrip, *had been on town sites and their appendages.* Only twenty-three preemption applications filed." Surveyed area of district about 1,500,000 acres.

TABLE XVI.—OFFICIAL DIRECTORY.

FEDERAL OFFICERS. *District Court of the United States.*

Office.	Name.	Residence.	Compensation.
Judge,	R. R. Nelson,	St. Paul,	$1,500.
Attorney,	E. M. Wilson,	Minneapolis.	
Marshall,	Wm. B. Gere,	St. Paul,	200 and fees.
Clerk,	G. W. Prescott,	St. Paul,	fees.

Times and Places of holding Court. Preston, 1st Monday in June; St. Paul, 1st Monday of October.

LAND OFFICERS.—*Surveyor General of the Public Lands*, for the district of Minnesota, Charles L. Emerson, office at St. Paul, salary $2,000.

Land Office.	Register.	Receiver
Cambridge,	H. N. Setzer,	M. H. Abbot.
St. Cloud,	Wm. A. Caruthers,	S. L. Hayes.
Chatfield,	John R. Bennett,	J. H. McKinney.
Forest City,	F. E. Massey,	J. D. Evans.
St. Peter,	S. Plumer,	B. F. Tillotson.
Henderson,	J. C. Dow,	Christopher Graham.
Portland,	J. S. Watrous,	John Whipple.
Otter Tail City,	Oscar Taylor,	William Sawyer.

INDIAN DEPARTMENT.—*Superintendent of Indian Affairs*, for the Northern Superintendency, including Minnesota, Wisconsin and Dakota, W. J. Cullen, bond, $100,000, salary, $2,000.

Name of Agency.	Tribe.	Agent.	Bond	Salary.
Winnebago,	Winnebagoes,	C. H. Mix,	$20,000	$1,500
Chippewa,	Chippewas, of Mississippi,	J. W. Lynde,	20,000	1,500
Saint Peters,	Sioux of Minnesota,	J. R. Brown,	50,000	1,500
———	Lake Superior Indians,	C. K. Drew,	20,000	1,500

REPRESENTATION IN CONGRESS.—*Senators:* Hon. Henry M. Rice, St. Paul. Term expires, 1863. Hon. M. S. Wilkinson, Mankato. Term expires, 1865.
Representatives: Hon. Cyrus Aldrich, Minneapolis. Hon. William Windam, Winona.

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State Government for the Year 1860.

Executive Branch, Elective Departments.

Office.	Name.	Residence.	Term ends.	Salary.
Governor,	Alex. Ramsey,	Saint Paul,	Jan. 1st, 1862,	$2,500
Lieut. Governor,	Ignatius Donnelly,	Nininger,	" "	$4 per day, during session of Legislature.
Sec'y of State,	J. H. Baker,	Blue Earth Co.,	Jan. 1st, 1862,	$1,500
Treasurer,	Charles Scheffer,	Stillwater,	" "	1,000
Auditor,	Wm. F. Dunbar,	Caledonia,	" 1861,	1,000
Att'y General,	G. E. Cole,	Faribault,	" 1862,	1,000

Appointees.

State Librarian, S. P. Jennison, St. Paul; Salary, $600.

Commissioner of Statistics, J. A. Wheelock, St. Paul; no salary.

Chancellor of State University, ex-officio Superintendent of Public Instruction, Rev. E. D. Neill, St. Paul; no salary.

Regents of University, Edward O. Hamlin, of Sauk Rapids; John M. Berry, of Faribault; Jared Benson, of Anoka; William A. Kimball and Uriah Thomas, of St. Anthony; no salaries.

Warden of State Prison, John S. Proctor, Stillwater; salary, $600.

Inspectors of State Prison, Oliver Parsons, Francis W. Noyes and Rudolpho Lehrnicke.

Surveyors of Lumber, 1st district, Samuel Winship; 2nd district, Mark T. Berry: 3d district, A. Tibbets; 4th district, D. W. Wellman.

Judiciary.

Supreme Court.

Office.	Name.	Residence.	Term ends.	Salary.
Chief Justice,	Lafayette Emmett,	St. Paul,	Jan. 1st, 1865,	$2,000
Associate "	Isaac Atwater,	Minneapolis,	" "	2,000
" "	Charles E. Flandrau,	Traverse des Sioux,	" "	2,000
Clerk,	J. J. Noah,	St. Paul,	" 1861,	1,000

Terms of court, first Monday of December and first Monday of July and such special terms as the court may direct, at St. Paul.

District Courts.

No. of Dist.	Judge.	Residence.	Term ends.	Salary.
1.	E. C. Palmer,	St. Paul,	Jan. 1, 1865,	$2,000
2.	S. J. R. McMillan,	Stillwater,	" "	2,000
3.	N. M. Donaldson,	Owatonna,	" "	2,000
4.	C. E. Vanderburgh,	Minneapolis,	" "	2,000
5.	Thomas Wilson,	Winona,	" "	2,000
6.	L. Branson,	Mankato,	" "	2,000

That part of the Directory prepared for this volume, embracing members of the Legislature, notaries public, commissioners of deeds, postmasters, county officers, &c., is unavoidably omitted, but will form a permanent feature of future volumes.

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TABLE XVII.—Expenditures of the General Government in Minnesota from 1849 to 1859 Inclusive.

1. *To fulfill Treaty obligations with Indian Tribes.*

	1849.	1850.	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.	1859.	Total.
Chippewas of Lake Superior and the Mississippi,	104,800	85,400	95,800	71,200	66,200	66,200	255,286.66					744,886.66
Chippewas of Lake Superior,								66,026.65	48,679.99	50,146.66	50,146.66	214,999.96
do. of the Mississippi,								37,333.35	30,000.01	30,400.01	30,400.01	128,133.38
do. Pillagers and Lake Winnebigoshish bands,								30,786.66	31,386.66	31,386.66	31,386.66	124,946.64
Sioux of the Mississippi,	38,750	38,750	38,750	538,022.38	173,800	135,050	205,800	173,800	192,891.47	150,050	150,050	1,835,713.85
Winnebagoes,	97,060	138,398.49	103,338.28	102,973.02	97,485	97,485	171,185	97,485	97,485	97,485	59,250	1,159,629.79
	240,610	262,548.49	237,888.28	712,195.40	337,485	298,735	632,271.66	405,431.66	400,443.13	359,468.33	321,233.33	4,208,310.28

2. *For the support of the Territorial Government.*

For what purpose appropriated.	1849.	1850.	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.	Total.
Salaries of Gov., Sup't. Ind. affairs, Secretary and Judges,	9,000	12,909.67	9,700	9,700	9,700	9,700	10,900	9,300	9,300		90,209.67
Contingent expenses,	350	1,650	1,000	1,000	1,000	1,000	1,000	1,000	1,000		9,000
Compensation and mileage of members of Legislative Assembly,	13,700	33,645.16	24,000	20,000	20,000	30,000	20,000	32,000	26,000		219,345.16
Public buildings, 1-2 for capital and 1-2 for prison at Stillwater,	20,000	20,000			25,000	10,000	11,500				86,500
Library,	5,000					500					5,500
Printing, &c.,				8,000			885	22,122.04			31,007.04
Taking census under act of Feb. 26,1857,										20,000	20,000
Total,	0	68,204.83	34,700	38,700	55,700	51,200	44,285	64,422.04	36,300	20,000	461,561 87

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3. *For Military Roads in Minnesota.*

Name of Road.	1850.	1853.	1854.	1855.	1857.	Total
Point Douglas and St. Louis river,	$15,000	$20,000	$20,000	$34,213.50	$31,425.50	$120,639.00
Point Douglas and Fort Ripley,	10,000	10,000	10,000	13,494.09	4,695.01	48,189.10
Wabasha and Mendota,	5,000	5,000	15,000	13,871,76	2,000.00	40,871.76
Mendota and Big Sioux,	5,000	5,000	25,000	27,475.68	———	62,475.68
Swan River and Long Prairie,	5,000	5,000	5,000	2,585.39	———	17,535.39
Fort Ripley and Red River,	———	———	———	10,000.00	———	10,000 00
St. Anthony and Fort Ripley,	———	———	———	5,000.00	———	5,000.00
Total,	$40,000	$45,000	$75,000	$106,590.42	$38,120.51	$304,710.93
Wagon road from Fort Ridgely to South Pass, in 1856, ...						50,000.00
						$354,710.93

4. *For various Public Works in Minnesota, (not elsewhere mentioned.)*

Year.	For what Purpose.	Amount.
1855.*	To erect a military post at or near the mouth of Pembina river,	$5,000
" " "	light-house on north shore of Lake Superior, at Beaver Bay, ...	6,000
1855,†	To erect a light-house on north shore of Lake Superior, at Grand Marais, ...	6,000
1857,*	To erect barracks and quarters at military post in north part of Minnesota territory, ...	15,000
1859,	To erect a light-house on north shore of Lake Superior, at or near the mouth of Two Island river, ...	5,000
1859,	To survey and establish the west boundary of the state, where not formed by natural features, ...	5,000
	Total, ...	$42,000

5. *Appropriations on Account of Indian Outrages.*

June 14, 1858.—	For defraying expenses of the several expeditions against Inkpadutas band, and in search, ransom and recovery of the female captives, ...	$20,000
March 3d, 1859.—	For reimbursement of expenses incurred in the Sunrise expedition, ...	2,639
	Total, ...	$22,639

Summary of Appropriations made by Congress, for the benefit of Minnesota, to December, 1859.

	Amount.
For expenses of territorial government, ...	$461,561.87
" building military roads, ...	304,710.93
" " road from Fort Ridgely to South Pass, ...	50,000.00
" various public works, ...	42,000.00
" *survey of public lands, estimated, ...	420,000.00
" *fulfillment of treaty stipulations with Indian tribes, . .	4,208,310.28
Total, ...	$5,486,583.08

* Appropriations expended in connection with the present Fort Abercrombie, on the Red River of the North, situated in east part of the territory of Dakota.
† By act of March 3d. 1859, the money to be expended at Grand Portage, at the mouth of Pigeon river, instead of at Grand Marais.
‡ Salaries of officers not included.

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TABLE XVIII.—Condition of the Banks on January 1st, 1860.

Name of Bank.	Date of Establishment.	Presidents	Cashiers.	Where Located.	Remarks.
Bank of the State of Minnesota,	Nov. 11th, 1858,	P. Whitney,	N. P. Langford,	Saint Paul,	Failed Oct. 16th, 1859.
Bank of Saint Paul,	Jan. 14th, 1859,	T. R. B. Eldredge,	C. J. Burnell,	Saint Paul,	
Bank of Rochester,	April 20th, "	Chas. W. Keith,	Aylmer Keith,	Rochester,	Failed June 23d, 1859.
Bank of Owatonna,	March 16th, "	F. McCormick,	A. S. Babcock,	Owatonna,	Failed July 18th, 1859
Bank of Red Wing,	June 28th, "		Chas. Pannell,	Red Wing,	Closing.
Bank of Chatfield,	June 21st, "	Dwight W. Keyes,	Wm. Ferguson,	Chatfield,	
Central Bank,	June 8th, "	J. Jay Knox,	H. M. Knox,	New Ulm,	
Chisago County Bank,	March 1st, "	Levi W. Folsom,	S. D. Gould,	Taylor's Falls,	Failed July 27th, 1859.
Exchange Bank,	Nov. 1st, 1858,	D. Graham,	N. Graham,	Glencoe,	Failed July 1st, 1859.
Farmers' Bank,	Jan. 20th, 1859,	W. J. Dexter,	J. H. Dawes,	Garden City,	Closing.
Fillmore County Bank,	May 28th, "	J. M. Marshall,	R. A. Kemp,	Preston,	Failed August 5th, 1859.
La Crosse and La Crescent Bank,	June 3d, "	Daniel Wells, Jr.	J. T. Foster,	Hokah,	
Nicollet County Bank,	Feb 2d, "	P. Whitney,	W. J. Lewell,	St. Peters,	Failed Oct. 16th, 1859.
People's Bank,	May 27th, "	E. S. Edgerton,	D. A. Monfort,	St. Peters,	
State Bank of Minnesota,	April 9th, "	A. L. Pritchard,	A. M. Pett,	Austin,	Closing.
Winona County Bank,	May 18th, "	A. W. Webster,	Z. H. Lake,	Winona,	

Name of Bank.	Capital.	Amount of Securities.	Classes of Securities.	Am't of securities Retired.	Classes of Securities Retired.	Whole Am't of Notes Issued.	Amount of Notes Retun'd.	Am't of Notes still outstand'g.
Bank of the State,	$35,000	$25,000	Minnesota 8s, and					
of Minnesota,		10,000	University 10s,	$20,000	Minn. 8s, and Un'v. 10s,	$35,000	$20,000	$15.000
Bank of St. Paul,	80,000	80,000	Minnesota 7s,			25,000	15,000	10,000
Bank of Rochester,	50,000	54,000	" "	34,000	Minnesota 7s,	49,400	30,540	18,860
Bank of Owatonna,	35,000	41,000	" "	23,000	" "	35,000	21,235	13,765
Bank of Red Wing,	25,000	29,000	" "	27,000	" "	25,000	23,632	1,368
Bank of Chatfield,	50,000	59,000	" "			50,000		50,000
Central Bank,	50,000	27,000	" "			23,000		23,000
Chisago County Bank,	35,000	36,000	" "	18,000	" "	33,360	17,094	16,266
Exchange Bank,	100,000	84,000	" "	45,000	" "	80,500	43,740	36,760
Farmers' Bank,	25,000	25,000	" 8s,	20,000	Minnesota 8s,	25,000	20,000	5,000
Fillmore County Bank,	25,000	30,000	" 7s,	22,000	Minnesota 7s,	25,000	18,100	6,900
La Crosse & La Cres't B'k,	50,000	59,000	" "	10,000	" "	50,700	9,537	41,163
Nicollet County Bank,	40,000	40,000	Minn. University 10s,	23,000	Minn. University 10s,	40,000	23,000	17,000
People's Bank,	50,000	30,000	Minnesota 7s,			25,905		25,905
State Bank of Minnesota,	25,000	25,000	Ohio 6s,	10,000	Ohio 6s,	25,000	10,000	15,000
Winona County Bank,	29,000	29,000	Minnesota 7s.	4,000	Minnesota 7s,	25,000	5,000	20,000
	$604,000	$633,000		$256,000		$572,865	$256,878	$315,987

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DOCUMENT "D."

AN ACT to prescribe the number of Members who shall compose the Senate and House of Representatives of the State of Minnesota, and to Apportion the Representation in both Houses, throughout the different sections of the State.

Be it enacted by the Legislature of the State of Minnesota:

SECTION 1. That for the next Legislature, and thereafter until a new apportionment shall have been made, the Senate of the State shall be composed of twenty-one [21] members, and the House of Representatives shall be composed of forty-two [42] members.

SECTION 2. That the representation in the Senate and House of Representatives be apportioned throughout the state in twenty-one [21] Senatorial and Representative Districts, as follows, to wit:

The First District shall be composed of the first and second wards in the City of St. Paul, and the Townships of McLean, New Canada, White Bear and Mound View, in Ramsey County, and shall be entitled to elect one [1] Senator and two [2] Representatives.

The Second District shall be composed of the Counties of Washington, Chisago, Pine and Kanabec, and shall be entitled to elect one [1] Senator and three [3] Representatives.

The Third District shall be composed of the Counties of Stearns, Todd, Cass, Wadena, Otter Tail, Toombs, Breckenridge, Douglas, Becker, Polk, Pembina, Morrison, Crow Wing, Aiken, Itasca, Buchanan, Carlton, St. Louis and Lake, and shall be entitled to elect one [1] Senator and three [3] Representatives.

The Fourth District shall be composed of that part of Hennepin County which lies on the east side of the Mississippi river, and the Counties of Manomin, Anoka, Sherburne, Benton, Isanti and Mille Lacs, and shall be entitled to elect one [1] Senator and two [2] Representatives.

The Fifth District shall be composed of that portion of Hennepin County which lies on the west side of the Mississippi river, and shall be entitled to elect one [1] Senator and two [2] Representatives.

The Sixth District shall be composed o the Counties of Carver, Wright, Meeker, McLeod, Kandiyohi and Monongalia, and shall be entitled to elect one [1] Senator and three [3] Representatives.

The Seventh District shall be composed of the County of Dakota, and shall be entitled to elect one [1] Senator and two [2] Representatives.

The Eighth District shall be composed of the County of Rice, and shall be entitled to elect one [1] Senator and two [2] Representatives.

The Ninth District shall be composed of the County of Goodhue, and shall be entitled to elect one [1] Senator and two [2] Representatives.

The Tenth District shall be composed of the County of Wabasha, and shall be entitled to elect one [1] Senator and one [1] Representative.

The Eleventh District shall be composed of the County of Winona, and shall be entitled to elect one [1] Senator and two [2] Representatives.

The Twelfth District shall be composed of the County of Olmsted, and shall be entitled to elect one [1] Senator and two [2] Representatives.

The Thirteenth District shall be composed of the County of Houston, and shall be entitled to elect one [1] Senator and one [1] Representative.

The Fourteenth District shall be composed of the County of Fillmore, and shall be entitled to elect one [1] Senator and three [3] Representatives.

The Fifteenth District shall be composed of the Counties of Mower and Dodge, and shall be entitled to elect one [1] Senator and two [2] Representatives.

The Sixteenth District shall be composed of the Counties of Steele, Waseca, and Freeborn, and shall be entitled to elect one [1] Senator and two [2] Representatives.

The Seventeenth District shall be composed of the Counties of Blue Earth and Le Sueur, and shall be entitled to elect one [1] Senator and three [3] Representatives.

The Eighteenth District shall be composed of the County of Scott, and shall be entitled to elect one [1] Senator and one [1] Representative.

The nineteenth District shall be composed of the Counties of Nicollet, Sibley,

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Renville, Pierce, Davis, and that portion of Brown County which lies west of Range thirty-three [33,] and shall be entitled to elect one [1] Senator and two [2] Representatives.

The Twentieth District shall be composed of the Counties of Faribault, Martin, Jackson, Cottonwood, Murray, Nobles, Pipestone, Rock, and that portion of Brown County which lies east of Range thirty-four [34,] and shall be entitled to elect one [one] Senator and one [1] Representative.

The Twenty-first District shall be composed of the Third and Fourth Wards in the City of St. Paul, and Reserve and Rose Townships in the County of Ramsey, and shall be entitled to elect one [1] Senator and one [1] Representative.

SECTION 3. This act shall take effect and be in force from and after its passage.

DOCUMENT "E."

APPROPRIATIONS BY CONGRESS, IN 1860, FOR THE BENEFIT OF MINNESOTA.

AN ACT making appropriation for the payment of the expenses of the legislative assembly of the Territory of Minnesota.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the sum of twenty-six thousand dollars, or so much thereof as has not been heretofore paid, appropriated by the act of August, Anno Domini eighteen hundred and fifty-seven, for the payment of the expenses of the legislative assembly of the Territory of Minnesota, be, and the same is hereby appropriated, out of any money in the treasury not otherwise appropriated, to be paid to the State of Minnesota.

Approved 16 June, 1860.

"For loss and destruction of property of citizens of Minnesota and Iowa, at Spirit Lake, in the year 1857, by Ink-pa-du-tah's band of Sioux Indians, accruing under the provisions of the Act of Congress, approved 30th June, 1834, $16,679.97: *Provided*, That the Secretary of the Interior shall first cause the true amounts of such losses of property to be investigated and adjusted in a manner satisfactory to him, and the amounts so ascertained shall be paid to the claimants, respectively, in full satisfaction thereof."

"For the construction of a military post in or near the valley of the Red River of the North, between the forty-sixth and forty-seventh degrees of north latitude, $50,000, the site to be selected and the post built under the direction of the Secretary of War."

"For the purchase and transportation of provisions and presents, and to meet the expenses necessary in holding a council with the Red Lake and Red River Chippewas, in the state of Minnesota, for the extinguishment of their title to the lands in that state, said Indians numbering about two thousand souls, $10,000; *Provided*, That the goods purchased in 1858 for the Yanctonnais band of Sioux, the reception of which was declined by them, may be used in the negotiations with the said Chippewas of Red Lake and Red River."

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